COMPUTERWORLD

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Package Ties DEC Micros To RCS Nets

By Don Leavitt
CW Staff

BRONXVILLE, N.Y. — Software that enables users to link microcomputers to commercial remote computing service (RCS) networks but still use the small units locally when appropriate has been introduced by a systems house here.

Already in use for more than a year, the software — from Product Group, Inc. (PGI) — interfaces Digital Equipment Corp. LSI-11s running under RT-11 to the international General Electric Corp. Mark III network. With some software changes, the LSI-11s have also been linked to an IBM-based RCS net, a spokesman noted.

One of the highlights of the development, according to PGI, is the human engineering that went into it. The software uses the same systems commands working in local mode as it does when working with the GE network.

"That obviously means the operators can feel comfortable with the system. They don't have to be constantly aware of which mode they are in so that they will use the right commands," the spokesman commented.

Another of the system's human engineering touches is shown in the reported ease with which the operator can switch from local to network mode. An entry at the LSI-11

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CW Photo by T. Scannell

Record Runtime

Bill Rodgers is escorted to the reviewing stand after setting a record in the Boston Marathon last week. Meanwhile, Honeywell, Inc.'s Tom Cusson checks his watch against the time shown on race-tracking terminal at the finish line. Story on Page 5.

Flooding Destroys Several CPU Sites In Southern City

By Brad Schultz
CW Staff

JACKSON, Miss. — Record flooding destroyed several computer facilities here last week and caused a number of users to move their systems to higher ground.

The rain-swollen Pearl River also overwhelmed some utility substations in Jackson, shutting off the flow of electricity to those users without alternate means of powering their systems. But a number of the largest users in Mississippi's capital narrowly escaped the loss of valuable data a blackout would have caused.

Fortune smiled on the state's Central DP Authority, the systems provider for 56 agencies that stood "high and dry" on a hill, while the Pearl crested at more than 25 feet above flood level, according to Frank C. Stebbins, the authority's director.

The waters swirled very close to the authority in Jackson's Robert E. Lee building just east of the Pearl's normal course. Everything west of that was inundated.

If utility power had failed, the authority would have had no backup generators to run its 6M-byte IBM 370/158 Attached Processor and 4M-byte 370/155. Running under MVS, the processors share 32 Control Data Corp. Model 11 disk subsystems and four of CDC's 3250-type subsystems.

Twenty-four remote job entry (RJE) terminals and, through a transaction-processing network, some 350 other terminals are tied to this configuration.

Around the clock, seven days a week, the facility supports such agencies as the University of Mississippi's Medical Center and the state's

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Telenet Cites Plans Hinging on Merger

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Telenet Corp. will undertake a major and aggressive expansion of its packet-switched data communications services if the company's proposed merger with General Telephone and Electronics Corp. (GTE) is approved.

In documents filed with the Federal Communications Commission (FCC) earlier this month, the two companies said the infusion of GTE investment capital will allow Telenet to begin a three-year, $38.3 million development program. Telenet proposed, among other things, to expand its system to serve 138 cities and offer extensive electronic mail facilities, wide-ranging protocol support, enhanced network management services and data encryption capabilities.

The GTE-Telenet merger, scheduled to go through by May 21, is being delayed by an FCC investigation into its possible anticompetitive impact on the U.S. telecommunications industry [CW, March 5]. The April 13 filing with the FCC was in response to a commission request for additional information on Telenet's long-range service plans.

The FCC asked the two firms to expand on their contention that Telenet will be unable to remain competitive in the do-

(Continued on Page 6)

States Say They're Hurting for Staff

By John Whitmarsh
CW Staff

LEXINGTON, Ky. — It's not cost overruns. It's not management disinterest. It's not privacy.

Rather, the most serious problem facing managers of state government information systems is the lack of qualified personnel available to fill government DP ranks.

"No other problem has shown the dramatic reversal of its impact as has the recruitment of personnel," the National Association for State Information Systems (Nasis) reported. "Since 1971, it has moved from last place to first place as the most serious external problem."

This and other findings on the condition of state government information systems appeared in Nasis' ninth annual report, published here recently. The report was for calendar year 1978 based on a survey of the DP departments of all 50 states, the Canadian province of Quebec and, for the first time, the U.S. territory of Guam.

Although taking a back seat to recruitment, the external problems of management understanding, lack of a DP plan and management commitment retained their positions as the chief areas over which state DP managers have little control.

Internal problems were un-

(Continued on Page 8)

DPers Kept Busy at Grounded Airline

By Jay Woodruff
CW Staff

CHICAGO — "Computer operations are the most active part of the company at the moment. Almost everything else is geared to flying, and we're not flying," United Airlines' vice-president of computer and commercial services said last week.

But while reservations, flight scheduling, food scheduling and related services remain in a holding pattern until the strike keeping the airline on the ground is over, Glen Belden said there is still plenty to do.

Even though only 7,000 out of 54,000 employees are still working, more than half of the 1,700 employed in computer services are still on the job working at half pay.

The airline is continuing to maintain essential computer services. For example, there are no flight crews to schedule and no food to serve to the passengers, but the schedules

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With $650/Mo Package

User Gains Three CPU Hours Da

By Ronald A. Frank
CW Staff

SACRAMENTO, Calif. — A $650/mo independent teleprocessing software package has given a large data user here an additional three hours a day of scarce CPU resources.

The software that gave new life to the IBM 370/168 running at the State of California's Teale Data Center is Quick-Tube, a package from Evergreen Consulting, Inc. that makes Time-Sharing Option (TSO) systems running under Tcam operate with faster response times.

Quick-Tube was designed to shift TSO polling functions out of the mainframe to an IBM 370X or similar front end, thereby eliminating polling delays in the CPU.

Teale was running a version of Tcam which allowed users of IBM 3270 terminals to access both TSO and CICS applications from the same terminal. This mixed-mode Tcam operation included 125 terminals on 20 lines, causing excessive resource consumption on the mainframe, according to Richard Hoffman, manager of systems programming.

The Tcam application included both IBM 3270 and compatible CRTs from Four-Phase Systems, Inc. running on 20 multidropped lines. The network serves state agencies and includes about 15 sites at various locations within California. The CRTs operate at 4,800- and 9,600 bit/sec, using Bell lines and data sets.

Three Options

In January, Tcam polling operations ate up 25.9% of the available CPU hours and more than half of the system's Execute Channel Program commands, which are required for each I/O operation.

The center basically had three available ways to deal with Tcam's excess resource consumption. Teale could install IBM's Vtam Network Control Program (NCP), which would move the polling load out to the center's Comten, Inc. 3670 front end; the Tcam polling delay could be extended beyond one second; or the center could install Quick-Tube, which would allow autopolling of all Tcam terminals.

The installation of Vtam/NCP was probably the best long-term solution, according to Hoffman, but it would have taken at least one year to implement. A short-term solution was needed before then.

A longer (three second) poll delay was tested which reduced Tcam resource consumption by about 35%, but it was felt that any further increase in the delay would "severely impact user response time," Hoffman said.

Quick-Tube Installed

In February, Teale installed Quick-Tube with significant results. Based on statistics collected by Hoffman, Tcam CPU hours dropped from 25.9% to only 1.4% per day.

With the TSO work being handled with greatly reduced CPU resources, the data center was able to boost other applications. Batch jobs that had been running 4.7 hours per day were increased to 7.1 hours. TSO was increased from 1.7 hours to 2.3 hours per day.

Based on Hoffman's figures, Quick-Tube allowed Teale to recover 19.7% of available CPU cycles. According to IBM's Resource Measurement Facility (RMF) tests, 22% of available CPU cycles were available for other applications.

With conservative cost figures for mainframes, Hoffman estimated the installation of the independent package means a savings of about $7,900/mo to the data center.

One problem did arise as a result of the reduced CPU consumption. The data center could not take advantage of the extra CPU cycles during the prime shift because of a constraint on memory.

This problem was indicated by excessive paging rates that approached 90 to 100 pages per second and an increase in CPU wait time to 18% after Quick-Tube was installed.

In March, Teale added 1M byte of Intel Corp. memory to the Model 168, which reduced the paging rate to 65 to 70 pages per second. The savings from Quick-Tube will enable Teale to pay for its added memory in about 10 months, but the software would have been an improvement even without the additional storage, Hoffman said.

Correction

A recent *Computerworld* editorial indicated that parts of IBM's Series 30 processors might not be new and therefore not available for Investment Tax Credit [CW, March 19]. This was in error.

The Series 30 machines are "in new production" and all are 100% eligible for that tax credit, according to IBM.

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Cary: IBM Vetoed Spin-Off for Small Machines

By Connie Winkler
CW Staff

NEW YORK — IBM's highest executives vetoed spinning off a subsidiary to market small computer and office systems because it was too expensive, IBM Chairman Frank T. Cary said here last week. Cary was testifying in his latest deposition for the U.S. vs. IBM antitrust trial.

"Establishing a separate legal entity entails a lot of organizational breakage and legal expenses that we felt were not justified," Cary said about the decision to reject the plan last fall at an IBM executives' conference in Sugarbush, Vt. "I was so convinced it was too expensive that it didn't go much further."

CW Photo by C. Winkler

Attorney Thomas D. Barr (left) and IBM Chairman Frank T. Cary take a breather outside the courthouse in New York last week.

Cary said IBM studied various levels of self-sufficiency for what are now the General Business Group (GBG) and the General Business Group International (GBGI), up to and including a separate subsidiary.

GBG today is the umbrella over the General Systems Division (GSD), Office Products Division (OPD), General Technology Division (GTD) and Information Records Division (IRD). To spin these off with GBGI would require giving the new entity disk and tape storage development and manufacturing capabilities and an overseas manufacturing capability.

Spinning off GBG would clearly separate the smaller computer business from IBM's mainframe business now under the Data Processing Product Group (DPPG). According to Cary's testimony, as DPPG introduces smaller machines and GSD product capabilities increase, the two divisions find themselves competing for the same customers.

The question of the future of GSD and OPD may not be settled, however Cary said a task force is currently "looking at organization between OPD and GSD."

The GBG split had been discussed in the press [CW, Oct 23], and the Justice Department head lawyer on the IBM case, Robert J. Staal, used a February 1979 magazine article to bring the spin-off to Cary's attention.

These questions are of interest to the government because they would affect what would happen if IBM were found to be a monopoly and a divestiture were ordered. In addition, the government has argued throughout this lengthy trial that there is a distinct general-purpose computer market — DPPG's target — and a separate small computer market.

The GBG task force study was one subject IBM's chief counsel Thomas D. Barr allowed Cary to discuss. Barr would not allow the IBM chairman to talk about unannounced products or Satellite Business Systems (SBS), IBM's joint venture into the satellite communications business.

Cary did say, however, that IBM's System Communications Division is making ground station dishes that receive and transfer signals from the satellite.

A flare-up over the satellite questioning began Tuesday, April 17, when Barr argued that Staal was fishing for information for other Justice Department investigations into SBS.

Staal, citing an order by Judge David N. Edelstein, the judge in this case, said IBM could not refuse to answer questions on grounds of irrelevancy. Staal then left the room — it was lunch time.

Throughout the deposition, which was postponed for a week because Staal was sick, Barr complained the questioning was not related to any coming cross-examination of Cary.

"This is a plain example of deliberate harrassment," Barr said.

Cary has given depositions seven other times for a total of 35 days in relation to the various antitrust actions against IBM. His answers have been quick and his manner confident, although at times IBM's top executive looks bored.

On the first day of the deposition, Barr again refused to hand over the lengthy list of documents the government requested Cary to bring with him to aid the cross-examination. IBM has a motion pending with Edelstein to quash that document request.

Plea Turned Down

SAN FRANICSCO — A federal district court judge here rejected several IBM motions for a directed verdict in the Transamerica Corp. vs. IBM antitrust suit last week.

IBM had asked the judge to throw out the case when Transamerica finished presenting its side of the case, but Judge Robert H. Schnacke quickly rejected the IBM request and ordered IBM to begin its defense.

Defendents often file for a directed verdict after the case against them is presented. While such motions are common, they are also usually rejected, although directed verdicts were granted in both the Greyhound Computer Corp. and California Computer Products, Inc. cases against IBM.

The decision in the Greyhound case was later overturned by an appeals court. The Calcomp case is presently before a appeals court.

In the Transamerica case, IBM asked the court to overturn Transamerica's market definition, its evidence of IBM's conduct in the market, its pricing arguments and its damages claims. Rebuffed on all counts, IBM began its defense here last week.

'Times' Still Not Printing, But UK's DP Strikes Ending

By Rex Malik
Special to CW

LONDON — There's good news and bad news on the computer-related strike front here.

On the bad side, the venerable *Times* did not appear as scheduled last week, still plagued by the issue of automation [CW, Dec. 11]. On the good side, strikes by civil servants in government DP centers appear to be ending.

The *Times* had been scheduled to resume publication while negotiations with its unions continued, but last week, at the last minute, the National Graphical Association (NGA) refused to take part in the deal.

The NGA would not compromise on the issue of automation in the paper, insisting that its members and only its members could operate the automated typesetting equipment that *The Times* management wishes to install.

Meanwhile, the Civil and Public Service Association and the Society of Civil and Public Servants (SCPS), which have been "selectively" striking government DP centers around the country, last week agreed to terms with the government. The agreement may lead to an end of the strikes.

Although the leaders of the unions have agreed to the terms, the rank and file members are still in the process of voting on the contracts. The results are expected this week.

The selective strikes, however, which have brought many of the nation's most critical computer centers to a halt, continued with the support of a new group of computer operators last week.

In the lastest action, 50 members of the SCPS walked out of the Post Office computer centers in Leeds and Harmondsorth. Billing for telephone service provided by the Post Office under the aegis of the government is conducted in these centers.

Union officials estimate $200 million worth of bills each week will be held up in the center.

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Most Race Entrants Ever

Mini Times Boston Marathon's 7,800 Runners

By Tim Scannell
CW Staff

BOSTON — What began as an easily countable trickle soon turned into a deluge as runners poured across the wide, white finish line.

However, despite a record-breaking field of more than 7,800 official and 3,000 unofficial runners in the Boston Athletic Association's (BAA) 83rd Annual Marathon last week, a time-tracking minicomputer managed to record the time of every runner almost as quickly as each completed the arduous race.

Clocked by the Honeywell, Inc. Level 6 Model 47 computer located exactly on the finish line at Boston's Prudential Center, Massachusetts' Bill Rodgers unquestionably won the race, setting a speed record for the yearly event. Aided by a light, steady drizzle and chilly temperatures — characteristic of New England spring weather — the triumphant runner covered the rain-soaked 26-mile, 385-yard course in 2:9:27.

Rodgers broke the record he set in 1975, during similar weather conditions, by a full 28 seconds. In fact, this year marked the third BAA Marathon win for Rodgers, who also won the race last year.

Controlling the Masses

Although there were no DP-related scoring problems, the number of runners participating this year as well as the crowd of onlookers created a potential for timekeeping chaos, according to Tom Eifler, a Honeywell spokesman.

At the Hopkinton starting point, the throng of marathoners stretched for a mile from the starting line, forcing the racers to walk instead of run after the starting shot was sounded.

In last year's race, Honeywell's computer-scoring effort was hampered by legions of enthusiastic bystanders who occasionally blocked the computer operator's view of the runners as they crossed the finish line, which could have added seconds to the lapsed time.

This year, however, Boston Police and yellow-hatted BAA officials and volunteers enforced strict spectator rules, keeping the crowds back with ropes and wooden barricades.

Crowds Held Back

"The thing that we liked about this race in particular was that the crowds were effectively held back," Honeywell's Eifler commented. "It was easy to see the runners crossing the [finish] line and push a button at the precise second, telling the computer that the athlete had crossed the line."

All the marathoners maintained order after they passed the finish line and entered the rope chutes, Eifler noted. "Since we had [the runners'] numbers in sequence it was easy to match those up with the times we already had in the computer's memory bank."

Three Parts

Honeywell's timing and scoring of the race, whose course passes through seven cities, is actually accomplished in three concurrent parts. First, the minicomputer captures the runners' elapsed time from the start of the race to the time they cross the Boston finish line via a push button, linked to one of six VIP 7205 terminals.

Pushing the button signals the mini to read the current elapsed time and store it, Eifler said.

Next, the computer tracks a number of selected runners, such as Rodgers, at specific checkpoints to measure performance and stride. Finally, the runners' numbers are recorded as they cross the finish line and are later merged with each athlete's respective official time, which is stored in an 80M-byte disk unit.

'Racer' Software

Using Honeywelll's Runner Administration and Computerized Entry Routine (Racer) software, the 128K-word system processed and printed out the names and statistics of more than 7,000 runners in less than three hours after the first athlete crossed the finish line, Eifler noted.

This is the fifth consecutive year that Honeywell has donated its computer and time, estimated to be worth about $30,000, to the marathon.

Other Victors

Following close on the rubber heels of Rodgers throughout the race, Toshihiko Seko of Japan came in second at 2:10:12, just 250 yards behind the winner. Joan Benoit of Brunswick, Maine, set a record for the women's division, running the course in 2:35:15 and beating the previous record by more than 9.5 minutes.

Kenneth Archer of Akron, Ohio, won the wheelchair race by completing the formidable trek in 2:38:59.

As the winner of the 83rd BAA marathon, Rodgers received a diamond-studded gold sunburst medal as well as the traditional laurel wreath crown presented to him by Boston Mayor Kevin White and Massachusetts Gov. Edward King.

Trophies and medals were awarded to more than 100 other official marathon participants.

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Flood Path Predicted

By a CW Staff Writer

VICKSBURG, Miss. — Software simulation and computer-assisted data collection have helped the Army Corps of Engineers grapple with this month's devastating floods in Alabama, Mississippi and Louisiana.

Computer systems allowed the corps' Waterways Experiment Station here to forecast the direction of the overflow caused by unusually severe rainfall in recent weeks, according to Billy Parker, the station's operations director.

The corps helps communities located in the path of overflowing rivers by designing protective levees and by diverting the water through spillways.

The Vicksburg station ran forecasting software on its Honeywell, Inc. G635 CPU that supports the corps' decision making in this matter, Parker said. The station's Texas Instruments, Inc. Advanced Scientific Computer also may run such tasks in the next few weeks.

River Overruns Some Sites, Sends Other Users Packing

(Continued from Page 1)

highway patrol, motor vehicles department and treasurer's office. About 31,000 jobs are handled each month, Stebbins said.

Equipment Rescued

Mississippi's Blue Cross/Blue Shield organization moved fast on Easter weekend to avoid losing its 1.5M-byte Honeywell, Inc. 66/40 mainframe. Last week several feet of water covered the floor where this system normally runs, according to Clyde Ballard, Blue Cross' DP director and Stebbins' predecessor at the authority.

Called back from an Easter vacation, Ballard rounded up the systems experts he could locate and together they carried the CPU, attached peripherals and associated cabling to the Blue Cross building's second floor. The Pearl was nearly lapping at their heels as the last of the equipment was evacuated from its first floor installation, but Ballard said no physical hardware damage occurred.

The system was set up and is now running with diminished capabilities at its temporary shelter.

Jackson's Blue Cross handles industrial health insurance claims and is Mississippi's Medicaid center. Through the Datanet communications network, six time-sharing terminals and 36 other terminals are linked to the 66/40. The facility also serves RJE sites at five hospitals.

The raging Pearl wiped out BIC Corp.'s Honeywell 66/05 installation, according to the wholesale food distributor's Gary Mazzafero. The DP manager said the dollar value of this loss is not yet known, but it seems one of the worst systems casualties attributable to the flooding.

Honeywell responded swiftly to BIC's appeals for help by providing alternative facilities in Atlanta and at local sites, Mazzafero said.

Narrow Escapes

Other users reported narrow escapes, but no losses. The City of Jackson's Honeywell 2050A and 66/40 (the latter just delivered, but not yet installed) are located in the basement of the municipal police department close to the rampaging river. A number of users told *Computerworld* the city's facility was lost, but DP director William R. Hazelwood said those reports were greatly exaggerated.

The Deposit Guaranty National Bank in Jackson also debunked reports that its two IBM 3031 mainframes had been destroyed. The bank was untouched by the Pearl and had a diesel-powered electric generator available in case utility power was lost.

Most users polled by CW said their systems' insurance policies provided coverage for flood damage. Stebbins said the authority's DP gear was protected up to $3.5 million.

Some near-victims said they would add auxiliary power units so future blackouts could not disrupt DP opertions, but a number justified their lack of backup power by citing the improbability of the Pearl disaster.

The last time Jackson encountered such flooding was in 1902, when the river crested at a level a few feet lower than the Blue Cross mainframe's normal elevation.

Now, nearly eight decades later, unusually heavy April rains have caused the Pearl and other rivers in the lower Mississippi River valley to jump their banks, forcing the evacuation of thousands of communities in Alabama, Mississippi and Louisiana. In the metropolitan Jackson area alone, more than 17,000 persons have reportedly fled the deluge.

Telenet to Expand If Merger Approved

(Continued from Page 1)

mestic telecommunications market without the capital which, they earlier told the commission, is only available from GTE. Telenet has claimed that all other attempts to raise investment capital have been unsuccessful.

"Service expansion of new protocols and new services, improvement of customer features, significant geographic expansion of the network and cost-improvement programs" would be impossible without the capital infusion the merger would make possible, the firms reiterated in their most recent filing.

Development Program

"Assuming acquisition by GTE, Telenet has planned an aggressive development program," according to the companies' filing. Some of the expanded services and customer features planned after the merger are:

- "Extensive electronic mail facilities," which would permit "long-term storage and delayed delivery of messages produced at both intelligent and nonintelligent terminals on the network."
- The support of greater numbers of polled asynchronous terminal protocols. "Telenet has a large list of significant present and prospective customer organizations such as banks, insurance companies, financial institutions and the like, which need a carrier to provide support for their terminals." In most cases, these organizations' terminals are not currently supported by packet networks.
- The support of "a wide variety of additional synchronous protocols, both polled and unpolled." Telenet has "already begun the development of three such protocols, but there are large numbers of synchronous protocols remaining which will be implemented, including most significantly, IBM's [Synchronous Data Link Control] protocol" which, the document noted, is omitted from AT&T's Advanced Communications Service proposal.
- The installation, under a "major equipment installation program," of "fully redundant multiprocessor systems capable of handling all interface protocols offered by Telenet" in more than 60 additional cities, bringing the total so equipped to 88.

"Additionally, within the first year following the merger, Telenet plans to install microprocessor-based concentrator systems in approximately 50 more locations in the United States — increasing the number of cities in the network from 82 at present to a total of 138 cities. Expansion of the network into additional cities will take place thereafter on a continuing basis," the filing said.

- A significant extension of the storage available to individual terminal users to allow them to prespecify "a wide range of communications options."
- The addition of symbolic addressing to the system.
- The availability of data compression algorithms to the user.
- The incorporation of data encryption technology "within a communications processor at the user's site."
- The upgrading of network equipment "to permit the use of 1.554M bit/sec transmission facilities for both backbone network and host access lines."
- Through "an expanded Telenet hardware development program," the introduction of a generation "of network equipment to take advantage of the continuing advances in integrated circuit technology."
- The addition of a considerably wider range of network management services and statistical tools for the user.
- "An extensive research and development program into the optimal use of packet-switching technology for satellite transmission, for packet radio local distribution and for voice transmission."

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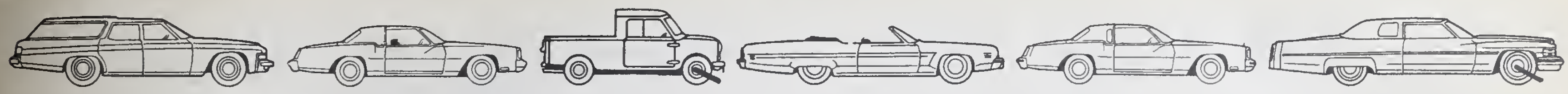


Denver Boot Gets Computerized Grip on Boston

By Tim Scannell
CW Staff

BOSTON — It's big, it's yellow and it's ugly, but its computerized grip has already become as much a part of the Boston scene as cobblestones and baked beans.

The Denver boot, locally referred to as the Boston buckle, is a vise-like device that clamps to an automobile's front wheel, rendering the vehicle immobile. Used as both an actual and a psychological weapon against parking scofflaws, the brightly painted boot is an alternative to towing that is reserved for cars whose owners have five or more unpaid parking tickets.

Although the city's booters and a team of 15 full-time spotters still have to search the streets for a scofflaw's car, the task is made easier by an IBM 370/158 mainframe located at Boston's City Hall.

The system maintains a file of parking offenders, their license plate numbers and a brief description of their cars. It generates a printed list of these offenders that is used by both the city Traffic and Parking Department and the Police Towing Unit to identify boot candidates.

Currently, the list contains the vehicular particulars of about 50,000 individuals.

On the List?

"We don't know how many [parking violations] you have by looking at the book. We only know that if you're on the list, you have at least five," according to Police Lt. John Ciccolo, commanding officer of the Towing Unit.

Before a car is booted or towed, its license plate number is called in to the dispatcher at police headquarters and keyed into a terminal that is on-line with the City Hall computer. The police then notify the towing/booting unit whether the tickets were recently paid or if the fines are still outstanding.

"If you come up on the machine, we know you have not paid . . . and we boot or tow your car," Ciccolo explained.

Ruse Thwarted

Recently, the Boston office of the state's Registry of Motor Vehicles was given a copy of the city's scofflaw book so offenders' names could be checked against those people who request new license plates for their cars. Drivers with five or more tickets had been changing their plate numbers to thwart the booting posse.

There are several obvious advantages to booting a scofflaw's car rather than towing it to a garage or storage lot, the police lieutenant pointed out. For instance, tow trucks don't have to maneuver in and out of traffic or block traffic on a one-way street to latch onto a car.

And booting a car eliminates the possibility of damaging an automobile by towing, which was a particularly annoying problem in preboot days.

In addition, the boot's portability allows the towing unit to immobilize four cars for every one that is towed.

"People are much happier if you boot them because you're not moving their car and they don't have to pay a storage or towing fee," Ciccolo said. "For some reason, people do not mind the boot as much as they do seeing their car physically lifted into the air and being dragged away."

$1.5 Million Collected

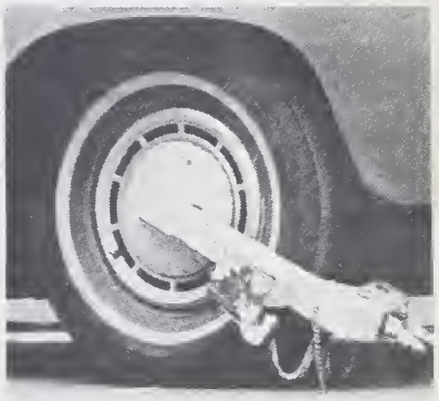
Currently, more than 100 cars per day are booted by the city's Traffic and Parking Department and Police Towing Unit, resulting in the daily collection of nearly $14,000 in outstanding fines. Since the program's introduction in 1977, about $1.5 million has been collected from errant drivers; over the next year, the city hopes to bring in a whopping $12 million in unpaid tickets.

Just One Problem

The only problem with the booting program is that there aren't enough boots to go around.

The city presently has 145 of the metal handcuffs, and about 10% to 15% of the scofflaws wait three or four days before settling their parking tickets and releasing their cars.

However, another 100 boots are scheduled to be delivered within a few weeks.



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States Tell Nasis They're Hurting for DPers

(Continued from Page 1)

changed from 1977, according to the report. "Missed programming schedules" and "costs too high" kept their No. 1 and No. 2 positions, respectively.

In addition, programming backlogs and missed production schedules were more serious internal problems this year than last and the report concluded, "the ability to recruit and hold competent staff has a direct bearing on all four of these [internal] problems and greatly hampers the manager's ability to resolve them."

Minis: 'Startling Growth'

In the area of equipment, Nasis collected information on computer inventories in each state. Details on computer systems configurations, data entry and off-line peripherals appear at the end of the report.

Drawing absolute comparisons between year-to-year data is risky, Nasis cautioned, because of variances in the states' reporting methods. Nevertheless, the association found a "startling growth in the number of minicomputers installed." The report said minicomputers doubled both in absolute installations and as a percentage of all systems installed.

Statistics documenting the minicomputer surge of 1978 confirmed the findings of 1977's report. At that time, Nasis found "a number of medium-sized installations have upgraded to larger equipment and the majority of the growth has been in minis."

Greater minicomputer usage paralleled a second trend — the tendency of DP managers to spurn leasing as a method of acquiring computer hardware.

The use of the lease as a method for acquiring large-scale and mini systems "markedly declined," according to the report. But DP managers increasingly favored such leasing arrangements to obtain medium- and small-scale systems.

"A tentative conclusion," Nasis said, "may be that there are plans for displacements of these latter systems in the near term."

Nasis also detected a resurgence in DP hiring. The association found the rate of growth in the number of state DP employees last year snapped back to mid-1970's levels of 4% to 5% annually.

Furthermore, the distribution of those employees by employment category showed a large percentage of them classified as management.

Nasis cited two reasons for the growing management category. First, the association explained, the creation of new types of managerial positions such as data base and data communications administrators has swelled the category to its present size. Second, the greater use of distributed networks requires more supervisory positions in the user agency offices.

Pay Improvements Cited

The states also have more DP chiefs and those managers are better paid than in 1977, according to Nasis figures.

For example, third-level managers last year earned a high of $47,130 in some states and a low of $20,000 in others compared with 1977's high of $42,501 and low of $20,000. Second-level managers' salaries ranged from $38,254 down to $16,400 in 1978 vs. $34,669 to $15,938 in 1977. First-level managers earned $11,300 to $30,870 last year vs. $14,140 to $29,800 the year before.

The salary range for systems analysts narrowed and dropped in 1978. They received a high of $25,100 to a low of $11,600 vs. $28,156 to $12,000 in 1977.

Salaries for systems programmers ranged from a high of $28,428 to a low of $13,398; application programmers, from $19,774 to $8,700; computer operators, from $15,337 to $7,500; and data entry personnel, from $12,387 to $6,799.

The drop in hardware expenditures continued a seven-year trend. In 1978, hardware accounted for only 27% of the state's total DP expenditures, the report found. Purchased software hovered around 1% of total expenditures.

Copies of the ninth annual report can be obtained for $20 each from Nasis, P.O. Box 11910, Lexington, Ky. 40578.

Package Links Micros, Commercial Nets

(Continued from Page 1)

keyboard controls the changeover, in either direction, so the user site stays in a mode until action is taken to change.

Two new commands enable the transfer of files between the micro and the mainframe, with built-in detection and correction of any errors introduced by the communications link, the spokesman noted.

Rather than building IBM-compatible systems commands when the LSI-11 was linked to an IBM-based network, PGI made the LSI-11 "transparent." The company adapted the software — essentially by adding another module — to make the LSI-11 "look like" an IBM 3767 terminal that could work directly with the host mainframe.

On the strength of experience with those two approaches, the spokesman said he is confident the software can be readily adapted to meet the interfacing and command requirements of any remotely accessible system.

(The PGI approach is also reminiscent of the use of a Datapoint Corp. 2200 at the Royal Mint in Canada. About five years ago, the 2200 began handling most of the DP work for the Numismatic Division — coping, for example, with a flood of orders for Montreal Olympics commemorative coins — but a link to the Systems Dimensions Ltd. RCS net, based on IBM 360/85s, handled sorting of the monster files far more efficiently than the Datapoint unit could.)

The PGI software provides file-building capabilities that go beyond what the GE network offers. Automatic line number generation, an easy-to-read character deletion, tabulation and dynamic creation of backup files are among the extensions, the spokesman claimed.

Optional features of the package include multikey numeric and alphanumeric sorting and column-wise file joining and editing. All of these allow data creation, checking and editing without connection to the network, he added.

PGI's routines are written in Macro-11. Since they run under RT-11, they support all standard DEC languages and software. This means user programs can be written in Basic, Fortran or assembly language.

The software is said to consume very little memory on the micro. Individual files of more than 44,000 characters can be accommodated in machines with 56K bytes of available memory, the spokesman said.

A license to use the basic PGI package on a single LSI-11 costs $17,000. Discounts are available for companies using the package on multiple microcomputers and when the software is supplied as part of a total computer installation.

PGI is at 22 Hobart St., Bronxville, N.Y. 10708.

United's CPUs Kept Busy

(Continued from Page 1)

are continually updated as part of a "resumption of service" plan so they will be current and usable when the strike is over.

"Those things we have to keep doing, we're doing," Belden said. Paychecks must be written for the management people who are still working, and day-to-day accounting operations must be completed.

The strike began at 12:01 a.m. March 31, when 18,000 International Association of Machinists and Aerospace Workers forced the airline to suspend approximately 1,600 daily departures — roughly 25% of the commercial flights in this country.

Of the airlines' DP centers in Denver, Chicago and San Francisco, the Denver site remains the most active because it runs the reservations service for Western International Hotels.

Denver also maintains a reservations service for 1,000 travel agents across the country and provides customer support to other airlines for aircraft maintenance and engineering services.

'Tough Competitor'

On top of these obligations, United — which has an annual DP budget of $100 million — is keeping the majority of its workers on the job because it wants to be as aggressive as possible when the strike is over. To meet this goal, most of the DPers are concentrating on development work.

"We intend to be a tough competitor when we come out of this," Belden declared. Unlike a lot of computer service operations, United puts 80% of programmer time into new applications. Many of those who were working in development before the strike are still there, he added.

United took care to keep as many upper echelon personnel at work as possible, even though they — like every one of the management people still working — receive half their normal salaries for the duration of the strike.

Nonmanagement workers who were laid off companywide include DPers from flight reservations, flight planning, flight monitoring and food scheduling positions. Other DPers had worked in communications and field service organizations, he said.

What is left of the DP operation has not been badly hurt by the strike, Belden indicated, although not everyone remaining in computer services is working on computers: "Our food services division has outside food sales, and we've had to send management people over there to cook eggs and things like that."

Although DP continues to be productive, it is not saving the company money. The $20 million-a-year communications system must be left open in spite of the fact that it gets very little use.

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Proposal to Cut Airspace Sparks Controller Protest

By Marguerite Zientara
CW Staff

WASHINGTON, D.C. — Federal Aviation Administrator Langhorne Bond late last year proposed lowering the floor of positive control airspace (PCA) from 18,000 feet to 10,000 feet east of the Mississippi River and in parts of California and to 12,500 feet over the Rocky Mountains.

While the proposed action is intended to make air traffic control protection available to 97% of scheduled air carrier passengers, there are factions within the aviation industry that see the proposal in a different light. Objections to the proposal focus on the questionable ability of currently installed air traffic control computer equipment to handle additional traffic data.

"The Federal Aviation Administration [FAA] steadfastly refuses to recognize that there have been serious miscalculations in the FAA's estimates in the mid-1960s of DP requirements in air traffic control," according to John B. Galipault, president of The Aviation Safety Institute of Worthington, Ohio.

"The amount of traffic handled by the contiguous air route traffic control centers [ARTCC] has far exceeded the power of existing ARTCC computer systems," he added.

Problems Around the Country

Such allegations would seem to be borne out by various DP-related problems reported within the last year at airports around the country.

Chicago's O'Hare International Airport, in particular, experienced a number of air traffic problems because of its computer system [CW, March 20, Nov. 6, 1978], resulting in slowdowns of air traffic that in one case impacted air travel throughout the mid-West.

Sixty-three O'Hare air traffic controllers, members of the Professional Air Traffic Controllers Organization (Patco), filed suit in 1975 against the FAA, the Civil Service Commission and the Department of Labor. They sought a computer backup unit for their radar control system, among other demands. The case was heard in January 1978, and a decision is pending.

'Choking' CPU

A slowdown similar to O'Hare's occurred at the Houston Regional ARTCC last November when its IBM 9020E "choked" after being fed too much flight plan data; it had not been programmed to automatically restrict its input.

For the past two years, Denver's Stapleton International Airport has also been requesting a backup system from the FAA through its Patco chapter, even though controllers there contend the system has "fantastic reliability."

Seven in Two Years

Stapleton has experienced seven computer outages in two years, each lasting one or two minutes, according to the data systems officer.

"Air traffic control can be done without computer coordination," according to one Stapleton controller, "but when you're working with it and it goes, it's hard to readjust your thinking."

FAA officials have consistently stated that no real danger to air passengers results from controllers' loss of alphanumeric display data, but controllers insist that the possibility of a midair collision increases in the first few minutes after a computer outage, when controllers could become disoriented and lose track of their planes.

While FAA chief Bond now seeks to lower the PCA, thus increasing the load systems must bear, the agency does not plan to install any larger capacity computers or computer backup systems in any major U.S. airports until at least 1986, according to an FAA spokesman [CW, Jan. 29].

Airport Radar Review Sought

By a CW Staff Writer

WASHINGTON, D.C. — Rep. Pat Schroeder (D-Colo.) has called for an immediate investigation of the radar computer system at Denver's Stapleton International Airport [CW, March 26] following a recent two-and-one-half-hour air traffic control computer outage there.

In a letter to Federal Aviation Administrator Langhorne Bond, Schroeder requested that the Federal Aviation Administration (FAA) investigate the need for a backup system. Schroeder also asked the FAA to look into the financing process for Stapleton and to determine how, when and why the failure occurred.

During the outage on March 17, a Frontier Airlines plane with one engine down and 50 passengers on board made an emergency landing, with only voice communications and radar information available to the air traffic controllers.

The loss of computer power, caused by two faulty memory boards, had resulted in the loss of alphanumeric radarscope displays indicating the altitudes, speeds and flight numbers of air traffic to the controllers.

More Than a Close Call

"Dead computers don't set well with me — especially ones following and identifying planes at Stapleton International Airport," Schroeder wrote.

(Continued on Page 10)

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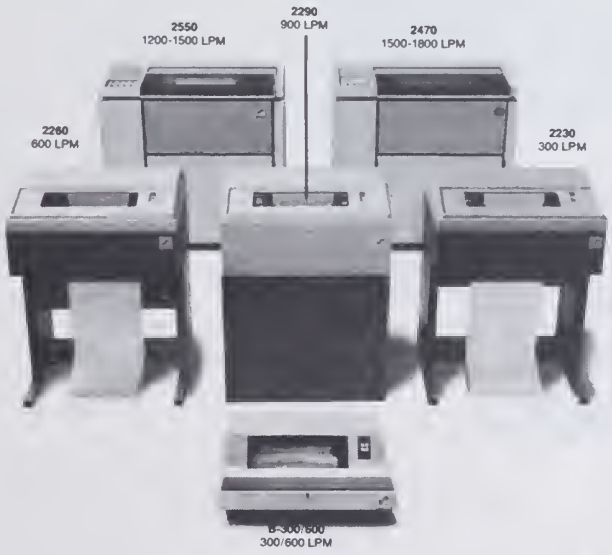

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'Horror Stories' Rife at Hearings

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — During recent Capitol Hill hearings on the confidentiality of personal medical records, one congressman asked those testifying for "horror stories" of privacy abuses.

But most of those appearing before the House Subcommittee on Government Information and Individual Rights needed little prompting. They had come well prepared to recount tales of careers ruined, marriages broken and mental health damaged through the invasion of medical information privacy. Predictably, the villain in many of the stories was a computer.

"Infinite storage capacity and linkage ability between computerized technologies has dealt the greatest blow to confidentiality," the House panel was told by Jane Rogers, director of legislative affairs for the American Medical Record Association. The subcommittee is considering several legislative proposals to protect medical record privacy.

"Massive nationwide data systems" are operated by, among others, Blue Cross/Blue Shield, Medicare, the Department of Health, Education and Welfare (HEW) and insurance companies, Rogers said. "These systems not only have the capacity to link data, but are active in this endeavor," she added.

Untreated Patients

John F. Shattuck, director of the American Civil Liberties Union (ACLU) Washington office, noted that many of those organizations, plus a variety of state and local government agencies, routinely maintain "computerized registries or data banks" of patients receiving certain prescription drugs, abortion patients, cancer patients, handicapped persons, psychiatric patients, drug addicts and clients of state-financed medical services.

"Such patients are seldom even aware that these data banks exist," Shattuck said. On the other hand, several witnesses pointed out that people who are aware of these far-flung reporting systems will often not seek needed medical treatment if they think disclosure of such treatment would be damaging or embarrassing.

"A state statute requiring physicians to report all prescriptions of certain medical drugs, including the names and addresses of patients using them, to a central computerized state data bank was upheld in 1977 by the U.S. Supreme Court in an ACLU action, despite substantial evidence that some patients were foregoing treatment because they feared that sensitive medical information about them would be misused once it left the hands of their physicians," Shattuck told the subcommittee.

Another case described by the ACLU representative involved the Multistate Information System (MSIS), which stores psychiatric records from eight states and the District of Columbia. "In 1974," Shattuck recounted, "three patients, three doctors, and a psychiatric therapist filed suit against the New York Department of Mental Hygiene, claiming that it was using medical information from MSIS for its own files and further disseminating it."

HEW Proposal

Striking a blow closer to home, Rogers told the house subcommittee that "perhaps the most frightening aspect of computerization of health records today is activity supported by Congress" and HEW.

HEW "will soon issue proposed regulations which call for the collection of a Uniform Hospital Discharge Data Set [UHDDS], which involves patient and [health care] provider identities, diagnoses, etc.," Rogers explained. "The UHDDS will be collected and processed by regional processors," which may include fiscal intermediaries, insurance companies and professional standards review organizations (PSRO).

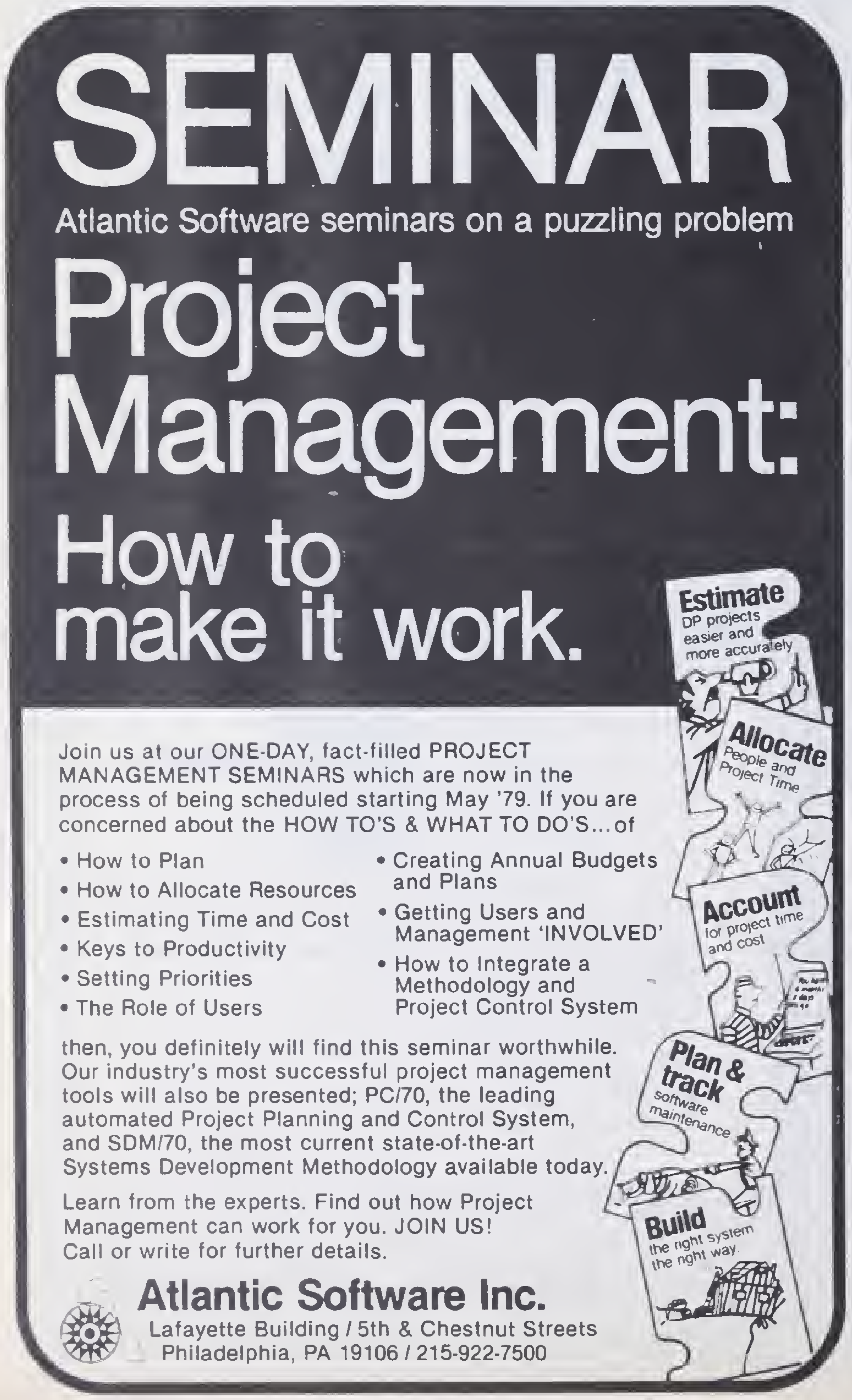
"Identifiable data will be linked to billing data and stored in a national data bank" at HEW, Rogers continued. The data will be distributed to PSROs — which review institutions involved in the delivery of publicly financed health care, such as Medicare and Medical — other federal departments and various health care agencies.

"The national health computer bank which we were told would never be created is here," she declared. "There is no reason to believe that at some future date this health data will not be linked to FBI, CIA, IRS, credit, insurance and other computers."

Rogers also noted that "any national health insurance program is likely to expand reporting requirements and centralize the information collected in data banks. The protections of these centralized records against improper disclosure and use becomes the responsibility of those who maintain the data banks.

"Unfortunately, it is known that codes can be broken and that there appears to be no known absolute safeguard against unlawful access to computer-stored information," she said.

"Legislation created the authority for current computer activity," Rogers told the subcommittee, calling for "stringent restrictions on release and linkage" of health care records.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Schroeder Requests Study Of Airport Radar Failure

(Continued from Page 9)

"I feel that incidents in the past and FAA predictions for the future demand an immediate review of the capability of the radar computer system at Stapleton," she continued.

"The entire radar computer system has now dropped to a level I consider unsafe for an airport which is the fourth largest in terms of itinerant operations," Schroeder wrote. "The dangers to communities adjacent to the airport, however, make the incident more than just a close call."

Schroeder cited an FAA draft that forecast the doubling of total airport operations at Stapleton by 1990. "This is an airport that was never intended for high-volume jet traffic," she noted.

"Since no new runways can be planned until an airport site is hammered out, the increased traffic will put an added burden on the radar system. Can the system perform without failing?" Schroeder asked.

Boxed In

No new runways can be planned at Stapleton because the airport is boxed in by an Army installation at the northeast end, the Rocky Mountains to the west and various communities in the remaining directions, according to a spokesman for the congresswoman.

In her letter, Schroeder cited a proposal by Bond, made late last year, to lower the floor of positive control airspace (PCA) — the area controllable from airport towers — from 18,000 feet to 12,500 feet over the Rocky Mountains.

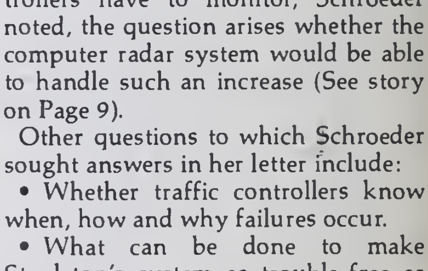
Since a lowered PCA would add even more planes to those the traffic controllers have to monitor, Schroeder noted, the question arises whether the computer radar system would be able to handle such an increase (See story on Page 9).

Other questions to which Schroeder sought answers in her letter include:

- Whether traffic controllers know when, how and why failures occur.
- What can be done to make Stapleton's system as trouble-free as possible.
- How many times the radar computer system must malfunction before a backup system is installed.

According to Paul Van Houweling, data systems officer at Stapleton, a dual computer system is scheduled for installation next February. The tower currently has a specially configured Univac mainframe with 64K bytes of memory and no computer or radar backup systems.

Bond has not yet responded to Schroeder's letter, according to a spokesman. "Whether [the response] will be your typical 'pablum' letter or whether it will say anything of substance is what I'm anxious to see," the spokesman said.



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Hearings Start on Capitol Hill

Medical Records Privacy: State or Federal Job?

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Should the states be responsible for guaranteeing that personal medical records be kept confidential, or is a federal law needed to assure a nationwide minimum standard?

That is the question members of a House of Representatives panel and a dozen witnesses debated at hearings here recently.

House panel members favored the state-level solution while Carter Administration witnesses and those from private industry argued for the federal approach.

"The maintenance, use and disclosure of medical information has become a national business. It requires the comprehensive, systematic approach that can only be provided by federal legislation," Department of Health, Education and Welfare general counsel Peter Libassi told the House Subcommittee on Government Information and Individual Rights.

Two Proposals

The subcommittee began hearings April 4 on bills put forward by the Carter Administration [CW, April 9] and the subcommittee's chairman, Rep. Richardson Preyer (D-N.C.). The two proposals, similar in scope, would give patients the right to review and, if necessary, correct their medical records. They would also restrict the types of disclosures that can be made of such records without patient approval.

The legislation is based on recommendations contained in the 1977 final report of the Privacy Protection Study Commission. Medical records privacy is the first privacy issue to be taken up by the 96th Congress. A number of other privacy proposals are awaiting consideration.

Sweeping Legislation

"Health care has entered the computer age," Dr. Alfred M. Freedman, chairman of the National Commission on Confidentiality of Health Records, told the subcommittee. "The increased demand by third parties such as insurers, government agencies, researchers and employers for access to personal health data has created a virtual revolution in health record keeping."

But subcommittee member Rep. John N. Erlenborn (R-Ill.) asked whether this problem might not be better covered by state laws. Erlenborn is "disturbed" by the trend of turning to the federal government for sweeping legislation.

"It's easier [than handling it on a state-by-state basis], but I question if it is the right way to go about it," he said.

Geller Defends White House

Henry Geller, head of the National Telecommunications and Information Administration, defended the White House view that "the status of current state law is a polyglot of protections and access laws largely limited to state-run institutions."

Further, he said, states cannot regulate federal access to this type of information.

Geller noted the proposed legislation would not preempt existing state laws. Anyone currently protected by a state or local statute would remain under that protection, but those not presently covered would receive the privacy protection the Administration considers a basic right of all citizens, he said.

The Issue of Cost

Another subcommittee member, Rep. Thomas H. Kindness (R-Ohio), joined Erlenborn in expressing concern over the impact of national legislation. Hospitals have experienced "a lot of daily living with federal regulation" — regulation that has significantly increased the cost of providing health care, Kindness noted.

Geller said the Administration's privacy proposals have been tailored so as not to entail undue costs, but he admitted there could very well be "start-up" costs involved in instructing record keepers how to implement the proposals.

Providing patient access to medical records would also involve some expense, but those costs would not be significant and the implementation burden would not force hospitals to hire additional personnel, he maintained.

Veterans Administration (VA) hospitals have been subject to similar regulations since the enactment of the 1974 Privacy Act, with "no inordinate burden" to their operations, Geller added.

Libassi backed up Geller with a statistic: of the approximately six million persons on file at VA hospitals, only about 10,000 have asked to see their records since the Privacy Act became law.

In addition, Geller said, medical record keepers might very well realize some savings if the legislation is passed. In reviewing their records systems in order to comply with the law, he ventured, hospitals might find ways to streamline their operations — perhaps by eliminating certain systems — thereby providing an aggregate savings to the institution.

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OECD Data Flow Guidelines May Cut Conflict

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Voluntary transborder data flow guidelines being developed by the Organization for Economic Cooperation and Development (OECD) should greatly minimize future conflicts between U.S. multinational companies and European privacy authorities, according to a State Department official.

By publicly embracing the guidelines after they are completed this summer, U.S. firms can demonstrate that they will provide adequate personal privacy protection for data sent across national boundaries, according to Morris Crawford, head of the State Department Office of Science and Technology Affairs.

Crawford told *Computerworld* recently that once the guidelines have been accepted by OECD members — 20 European countries plus several non-European nations such as the U.S. and Japan — data regulators in the individual countries will be obliged to accept "a vow of compliance" as proof of adequate privacy protection in a company's international operations.

"I don't think Europeans will ignore adherence and visible acceptance" by U.S. firms, he said, unless there are "frequent and clear violations."

He believes U.S. firms will have few if any reservations about accepting the guidelines. "I don't think that there is any company or anybody on the face of the earth, including me, that doesn't feel the U.S. government could do better by them," he stated, but "my impression is that the American companies are quite pleased with the guidelines."

The guidelines drafting group is scheduled to meet in Paris May 28 to put the final touches on the document, which Crawford expects will be sent to the organization's Council of Deputies in October. The guidelines are said to essentially reflect U.S. views on privacy and the free flow of information [CW, Jan. 15].

'Legal Persons' Issue

The remaining issue to which U.S. firms object most — protecting data concerning "legal persons" (corporations, small businesses and trade associations) — was removed from the guidelines at a meeting of the drafting group last month, according to the U.S. representative to the meeting, William Fishman, of the National Telecommunications and Information Administration.

"I think everyone recognizes that [privacy protection for legal persons] is a problem that has to be addressed at some point, but nothing that was done in the guidelines as such is going to have any direct impact," Fishman told *Computerworld*.

However, Crawford cautioned that the trend toward data flow restrictions is still in its infancy. "I certainly do not regard the guidelines or the Council of Europe's draft convention [CW, Nov. 13] or, on the domestic level, the privacy laws that have been passed in Europe as anything more than a very, very minor first step.

"I think the big action is the future . . . there is going to be a great deal more done in the way of legislative moves and in the way of regulatory, bureaucratic, administrative action in Europe that will affect transborder data flows."

In addition, there is "a very real concern" that the guidelines will not have the desired effectiveness, Crawford noted. His concern is heightened by the fact that the guidelines are only voluntary.

"I'm apprehensive, particuarly about France. I wonder whether there will not be some inclination [toward] more effective means for assuring compliance" with the guidelines.

(Continued on Page 15)

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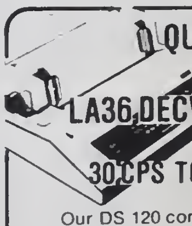

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As Part of Privacy Initiative

Carter Issues Guidelines on Matching Programs

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The Carter Administration has issued new guidelines for federal "computer matching" programs as part of its effort to upgrade personal privacy protection.

The programs, which use DP systems to compare various lists to identify fraud and abuse in government programs, will now come under tighter procedural restrictions, according to the Office of Management and Budget (OMB), which developed the guidelines.

James T. McIntyre Jr., director of the OMB, said the regulations, issued March 30, will balance "the government's need to maintain the integrity of federal programs with the need to protect an individual's right to privacy."

A typical matching program might compare a federal agency's personnel lists with the computer files of all those receiving welfare benefits in a certain jurisdiction. People whose names are found to be on both lists are then investigated on a case-by-case basis to determine whether they actually qualify for welfare payments.

A recent matching program conducted by the Department of Health, Education and Welfare (HEW) resulted in the indictment of 15 women here on charges of welfare fraud [CW, Oct. 16]. The programs have been widely criticized as threats to personal privacy and are considered by some to be an inefficient method of ensuring abuse-free government programs.

Reporting Procedures

Under the guidelines, any agency conducting an antifraud matching program must submit a complete description of the program to the OMB and Congress. Notice must be given 60 days in advance for any new match and reports must be updated annually or before the agency obtains records from a new match source.

In general, the reports must show that "a demonstrable financial benefit can be realized which significantly outweighs the cost of the match and any potential harm to individuals that could be caused by the matching program, [such as] public disclosure of information about an individual or improper termination of a benefit.

"The matching agency should consider alternative means of detecting or curtailing fraud and abuse or collecting debts owed to the federal government and should undertake a matching program only if the alternatives are less effective, more expensive or would present a greater threat to personal privacy," according to the guidelines.

The regulations also required that, "to the maximum extent possible," the programs be conducted "in-house" by federal agencies, rather than by contract. When contracted out, the programs must be conducted with "appropriate privacy and security provisions" consistent with the 1974 Privacy Act and "federal policies, regulations, standards and guidelines.

Destruction of Records

"Personal records obtained from the matching source should be destroyed or returned to the source within six months after the match takes place," according to the regulations.

Records of the "hits" — people identified during the matching process — should be destroyed within six months after the match "unless they are necessary for the completion of pending law enforcement or administrative activities consistent with the purpose of the matching program and authorized by law." The OMB must be notified in writing of the disposition of all such records.

The guidelines also instruct federal agencies not to give personal records to other organizations for match programs without first reviewing the program's justification report and determining "the appropriateness of disclosing the requested information for the proposed matching program."

Determining Magnitude of Problem

Discussing the guidelines recently, Walter Haase, head of the OMB's Information Systems Policy Division, told *Computerworld*, "Part of our objective is to learn more about the total magnitude of matching because nobody seems to be totally familiar with what is going on.

"Apparently, a large number of matches are performed as part of the routine administrative operations of a lot of agencies," he noted.

Haase added that the guidelines were developed to parallel the Administration's "privacy initiative." The new guidelines resulted from the President's decision "to tighten up the administration of a number of different provisions" of the Privacy Act.

Carter touched on the guidelines in his recent message to Congress transmitting the legislative proposals of his privacy initiative [CW, April 9]. Matching programs "are making an important contribution to reducing abuse of federal programs and are thereby saving taxpayers' money," Carter said. "However, safeguards are needed to protect the privacy of the innocent and to ensure that the use of 'matching' is properly limited."

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Managers on the Move

DEAN LILES has been named vice-president of management informations systems for Zale Corp., the Dallas-based speciality retailing company, with responsibilities for all DP and related activities.

Liles, a 15-year veteran of DP systems at IBM, held the position of national distribution industries market support manager. He joined IBM in 1964 after receiving a master's degree in economics from Lousisiana State University.

Liles also holds a bachelor's degree in economics from Mississippi College.

• • •

DR. WILHELM KEMPF has joined the Systems and Computer Technology Corp. site management team as director of the Northhampton County Area Community College computer center in Bethlehem, Pa.

He will be responsible for supervision, direction and planning of all activities at the facility.

Prior to the appointment, Kempf served as director of the Columbus (Ga.) College computer center and before that was director of computer services at North Adams (Mass.) State College.

Kempf holds bachelor's and master's degrees in physics and a doctorate in physical chemistry from the University of Munich, Germany.

• • •

JAMES D. MERRICK and RICHARD C. ROCK have been promoted in the management information services department at the Omaha headquarters of the Union Pacific Railroad Co.

Merrick was named director of systems design and development, responsible for creating systems for a variety of computer functions. He came to the company in 1973 as director of systems research and planning.

A graduate of Creighton University with a degree in physics, Merrick worked briefly for Western Electric and then joined IBM, where one of his accounts included Union Pacific.

Rock has been given additional responsibilities in the area of data services and retains his position as director of computer operations.

He has worked at Union Pacific since 1953, transferring to computer operations in 1957. He was named manager of computer operations in 1976 and was appointed director in 1978.

• • •

LES CLARK has been promoted to director of decision support systems for Marion Laboratories, Inc. and is in charge of directing the company's computer-based information systems development program.

Clark joined the company in 1976 as an operations review analyst and most recently served as manager of information systems development.

He holds an undergraduate degree in computer science/-operations research from the University of Missouri, an M.B.A. in industrial management from the University of Tennessee and an M.A. in economics from the University of Missouri.

Murchison

Merrick

• • •

DAVID L. STONEHILL will become vice-provost for computing at the University of Rochester (N.Y.) in June.

His responsibilities will include overall supervision and direction of the university's Towne House Computing Center and the Information Systems Center, as well as policy guidance for effective computer use and coordination of the Laboratory for Laser Energetics and the Medical Center computing facilities.

Stonehill was head of the State University of New York at Binghamton's computer center before accepting the vice-provost position.

He is a Phi Beta Kappa graduate of Depauw University, where he majored in physics and mathematics, and holds master's and doctorate degrees in physics from Yale University.

• • •

SAMUEL N. GREENWOOD JR. has been named data center director for GTE Data Services, Inc., Tampa, Fla., with responsibility for computer operations, data control, systems support, telecommunications, local data base control and all administrative functions.

Greenwood was formerly manager of DP facilities for the GTE Sylvania Lighting Products Group in Danvers, Mass.

He holds a B.S. degree in mathematics from Villanova University.

GORDON E. MURCHISON, systems development manager in the Information Systems Department of Coldwell Banker Commercial Brokerage Co., has been appointed assistant vice-president of the Los Angeles firm.

Murchison will continue to oversee development of new DP reporting systems for various Coldwell Banker commercial group companies. He has been with the company two years, starting as a senior systems analyst.

Before joining Coldwell, Murchison worked three years as a project manager at Glendale Federal Savings and Loan Association, and at Security Pacific National Bank as a systems development officer.

• • •

A.D. BAREFORD SR., W.R. GINN, LAWRENCE HILGEMAN and D. T. MARTIN have been appointed directors at Reynolds Metals Co.'s Management Information Services Division in Richmond, Va.

Bareford, a graduate of Virginia Commonwealth University, will be director of operations, responsible for the operations of all computers, telecommunications, report distribution and data entry

Ginn, director of technical support, will be responsible for DP software support and hardware selection. A graduate of Florence State College in Alabama, he was previously technical systems manager.

Hilgeman is director of general services. His responsibilities will include reprographics, records management, copier/reproduction systems and code control. He graduated from the University of Richmond.

As director of telecommunications, Martin will be in charge of analysis and selection of corporate telecommunications, computer and terminal hardware facilities.

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Minis Monitor U.S. Figure Skating Champions

VIENNA, Austria — The championship quality of American figure skaters was followed closely this year at the 1979 World Skating Championships by a pair of minicomputers.

Three Americans skated to the top of the competition, which featured 26 countries. The championships were covered by 500 journalists and television commentators.

Besides providing official DP results, including collection and tabulation of the judges' marks for the contestants, the two CII-Honeywell-Bull 61/60 computer systems at Honeywell Bull AG provided an information system for television commentators.

Tai Babilonia and Randy Gardner took the pairs competition, while Linda Frattiani posted a solid win in the women's event.

The computers were located at the company's Vienna DP center, and input terminals collected the judges' marks from the Vienna Stadthalle, the scene of the competition.

The systems operated in parallel, and various output terminals were connected to one of the systems. Provisional and final results, together with other information such as complete details of each competitor's performance, were printed on the output terminals.

CRTs Aided Announcers

Other terminals were part of the television commentator systems. CRTs kept announcers informed as they displayed the first 10 placings in the current competition. The lists were updated at the end of each skater's performance.

A closed circuit television installation conveyed the information to the control consoles of the TV units, where it was selected for broadcast by Eurovision and other networks.

The programs for the computerized results were essentially the same as those written by CII-Honeywell-Bull for the 1976 Innsbruck Winter Olympics, where the results service also was supplied by Honeywell. The programs were modified to take into account rule changes, and a program was added to provide additional information to facilitate the judges' work.

Flow Guidelines May Cut Conflict

(Continued from Page 12)

"One thing that nobody knows is the extent to which there will be violations on an international level that will require action. So far, there hasn't been any experience of that kind . . . The only experience under the European laws has been that the regulatory agencies require reports, require the companies to establish their internal [privacy protection] mechanisms and require them to file or register, whatever the terminology may be in the particular country," Crawford pointed out.

No Experience

"There hasn't been any real experience about the protections per se, and who knows? Maybe the companies . . . Are really the paragons that they say they are. If all this is true and there are no real violations, then perhaps there won't be any problem."

But Crawford noted that most of the national privacy laws in Europe are not yet in effect. The guidelines have been developed before "the policemen are out in force and knocking heads."

The German privacy protection law does not go into effect until next year, and the French law has been postponed for another six months or so, while both countries work out implementation procedures.

European Omnibus Laws

Unlike the U.S., where privacy laws are very specific and debated at great length before passage, European legislatures tend to pass omnibus laws and let the bureaucracies decide how to enforce them, Crawford said.

"The Europeans are still trying to figure out what they want to do about their privacy laws," he stated.

"And the regulators are having a perplexing problem because they can't just go off and start protecting data; they have to do it in very specific terms."

Reason for Hesitancy

"This is the reason why we were so hesitant about going into any kind of discussion in Europe considering an international agreement, because we didn't really know what it should say, and that is why the guidelines are drawn up in very general terms."

U.S. firms and trade associations have been "enormously" helpful to the State Department in its work with the OECD, Crawford said.

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It pays to call DDI first

Find Problem, Then Choose System, Users Told

By Ann Dooley
CW Staff

ST. PAUL, Minn. — Users must be able to pinpoint a problem in their companies or departments before committing themselves to any particular solutions, according to a panel of small business system vendors.

Speaking at the Computer Expo '79 held here recently, Dave Congdon, senior product manager for Burroughs Corp., told users and potential users in the audience that there are no hard and fast guidelines for determining when or if a computer system should be installed. The decision to install a system should be made as the result of a determination that a problem exists and not simply because the size of the company or the number of its employees seems to warrant such an installation.

And even then, it depends on the particular company and the particular problem, he noted.

One problem many users have is inventory management, according to Jerry Callahan, Data General Corp. district sales manager. Many businesses can no longer control their inventory with manual methods.

What previously worked for smaller inventories no longer does; companies are hopelessly bogged down by larger stocks and faster delivery demands. Computers often prove to be the answer in these cases, Callahan said.

Launching Investigations

If the user can't decide what the problem is, a consultant might be needed to help pinpoint it, Jim Carlson, Hewlett-Packard Co. product marketing manager, suggested.

If a company decides to use a third party instead of installing a system, it would be wise to investigate the financial health and technical expertise of the third party, Carlson advised attendees. NCR's project manager Mark Shelton agreed, adding that once a problem has been found and analyzed, a user should check with industry associates to see what systems they are using and whether those systems meet their needs. The more help obtained from professionals, the better, Shelton said.

Once the decision has been made to implement a small system, a user should analyze where his company is going so the right hardware and software can be selected to meet the company's growth needs, he recommended.

In choosing a system, a user should look at how a vendor handles an exceptional case such as a system failure, the vendors advised. Service and response time can be extremely important in the vendor selection process, HP's Carlson said.

Jerry Boomer, a marketing representative for Wang Laboratories, Inc., seconded this suggestion and added that references should be obtained to verify quoted response times. User groups are one source of current and honest information on vendor performances, he noted.

Checking Software Options

In addition to service and vendor reputation, software is an important consideration in choosing a vendor, the attendees were told. A user should check to see if the vendor provides packaged solutions tailored to the individual company's needs or develops an entire system for that company.

The user should also be able to determine which of these approaches he really needs. If a software package is well developed, a first-time user might find all his needs in a package, Boomer said.

But all software should be written in industry standard language, and vendors should be asked to provide demonstrations so the user can see in a general way how the package will handle the data, Boomer noted.

Users should be wary of buzzwords. They should be looking for solutions and should avoid buying technology for technology's sake, NCR's Shelton said.

All costs of system ownership should be weighed against the potential benefits. If the system doesn't make the job easier, the user has missed the mark, the vendors stated.

Users should examine whether the system is powerful and flexible enough for their needs. Flexibility in both hardware and software is important; eventually, the user should be able to program the system alone.

Once the vendor and system have been selected, the implementation phase should begin, suited to the user's schedules and needs. The most satisfied customers are those that have gone in a bit at a time, Wang's Boomer said.

Many employees are afraid of working with computers or are afraid computers will take away their jobs. It is therefore important to get everyone involved with the implementation from the top person down, the vendors noted.

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Ex-Astronaut Ties Space, DP Technologies

By Ann Dooley
CW Staff

ST. PAUL, Minn. — Computers today are what the wheel was to developing countries yesterday, former astronaut James Lovell told a group of Computer Expo '79 attendees here recently.

An astronaut on several of the National Aeronautics and Space Administration's Apollo and Gemini space flights, Lovell noted that space technology was in the forefront of developing computer technology. And the discoveries that were made in the space industry have produced spin-offs in a number of other industries, he said.

Computers were essential to the space industry from the start, Lovell said, recalling that on-board computers were often referred to as "the fourth astronaut." On the Apollo missions, for instance, it was the computer system that controlled the spaceship's navigation, charting its course and feeding the astronauts constant data about their location.

On one flight, however, Lovell had to manually guide the space ship to earth after he made an entry error on the computer that erased all memory of the ship's location from the data banks. So even as computers grow more sophisticated, they can never replace human effort, Lovell told his audience.

Forced Changes

The computers developed in the space race made many of today's computers possible, Lovell said. These computers have increased the productivity and efficiency of many industries which now rely on computers. But many of these industries had to be forcibly changed by technology, he said.

Lovell, now president of Fisk Telephone Systems, a distributing company, cited the telephone industry as an example of an industry forcibly undergoing computer driven changes. As recently as a decade ago, the telephone system was built on pre-World War II technology, with AT&T providing all facets of service.

But in 1968, the Carterfone decision brought major advances to the terminal industry by opening up competition. Later, the development of the PBX terminal mode married the computer and the telephone, he said.

Computing has brought several advances to the telephone industry, Lovell told the attendees. Computers are now used to control network costs by regulating which transmission line to use in order to select the least costly way of transmitting a call, he noted.

Among the successful spin-offs from the space industry are weather satellites that provide more complete, accurate and timely data and in doing so create cost savings for the agricultural and transportation industries, Lovell observed.

Communication satellites are another example, according to Lovell. These satellites have reduced the cost of overseas calls and brought communication capabilities to rural and underdeveloped countries, he said.

Navigation satellites have also benefited from space technology and provide nearly perfect accuracy on in-flight shipping and transportation operations, he added.

'DP Law Skills' To Start May 30 In San Francisco

WINTER PARK, Fla. — A series of seminars entitled "Computer Law Skills — A Practical Guide" will be offered by International Computer Negotiations, Inc., (ICN) May 30-June 1 in San Francisco.

The seminar is designed to provide interdisciplinary training to members of all professions involved in computer contracting. It should bridge the technology and language barriers often found by those with little or no experience in the team approach to DP acquisitions, according to an ICN spokesman.

The course will cover the contracting process, methods of protection, risk management, methods of resolving contract disputes and negotiating techniques.

Seminar instructors will include Richard L. Bernacchi, a partner with Irell & Manella and co-author of *Data Processing Contracts and the Law.* Also teaching will be J. Thomas Franklin, a partner with Sweeney & Franklin and an author and lecturer on computers and the law.

Roy N. Freed, a partner with Powers & Hall and the author of *Computers and Law — A Reference Work,* will also be an instructor.

Future seminars will be held in Chicago, Sept. 5-7; New Orleans, Oct. 31-Nov. 2; and Orlando, Jan. 14-16.

Registration for the seminar is $595. ICN is located at 1331 Palmetto Ave., Winter Park, Fla. 32789.

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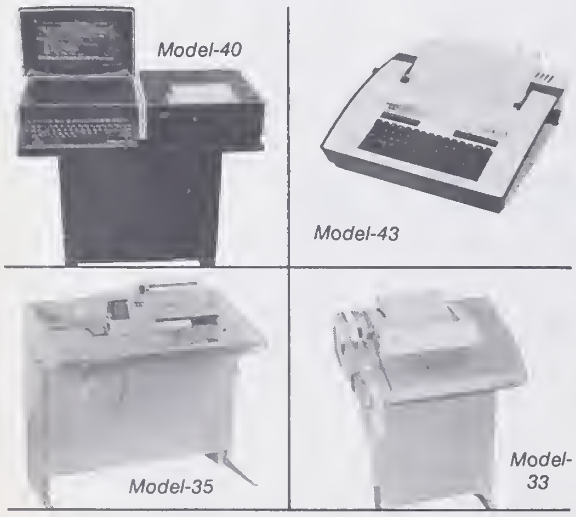

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April 23, 1979

LEAR SIEGLER'S TOP-SECRET NEW FACILITY UNEARTHED?

LSI Approaching 100,000 Units Shipped
Page 30

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ADM-3A Update—Who Are You Calling Dumb?
Page 16

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LSI Consumed by Giant Growth!
Page 19

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Extensive Service Organization: Your Key to Happiness
Page 25

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LSI Floodgates Opening for Peripherals
Page 80

* * *

Future Seen as Unstoppable, Experts Warn
Page 32

Classified Lear Siegler photo believed by some to depict new top-secret installation in Anaheim. Doubters, however, note certain similarities to Great Pyramid of Cheops. INFORMER PHOTO

INFORMER sources today received what may be the first photo of Lear Siegler/Data Products' top-secret new Anaheim building.

Regular INFORMER readers will remember that we broke the news just last week of LSI's "New Production Facility," soon to be shipping back-ordered computer peripherals. The new facility also ends rumors that Lear Siegler had difficulty delivering the wonder devices known as Project X.

But we at the INFORMER feel there is more to the story than is visible. Rumors of a mysterious Project Y, for example, have been on the increase. The question leaps to mind: what could Project Y possibly be?

There is room for speculation, especially at the INFORMER. Lear Siegler, the people who design peripherals around their customers, have very well-accepted products, such as the legendary Dumb Terminal® terminal and Ballistic™ Printhead. And with their new, additional 116,000 sq. ft. Anaheim facility, they could conceivably come up with something as startling as Project X.

After all, Lear Siegler is the company with the simple, reliable, low-cost terminal design and one logic board concept. They're also the company that has one of the most extensive service organizations in the industry. And being part of a billion dollar corporation, some experts therefore believe Lear Siegler is up to something even greater than filling their record backlogs.

Just last week, our dauntless INFORMER reporter was able to talk to Bill Terry, President of the Data Products Division. But there was no "hard news" from Terry either to confirm or deny persistent industry rumors. When asked directly by our reporter about the purported Project Y, Terry simply said, "Project who?"

Nonetheless, hundreds of rumors cannot be wrong, to paraphrase INFORMER policy, and we intend to plumb the depths of this latest LSI story until all leads have been followed up.

One such rumor hints at a clandestine undertaking begun behind a supposedly locked and

(Please turn to page 6, column 2)

Mini Keeping Antwerp Free From Floodwater

ANTWERP, Belgium – A minicomputer here is helping to keep Antwerp free from floodwater. The mini is an integral part of an automatic system designed to monitor water levels in Antwerp's harbor at Boudewijn lock. This lock connects the harbor with the river Schelde.

The system was developed by NBA Controls, Ltd. of Farnborough, England, to control the transfer of water between the harbor and the Schelde. To prevent the flooding of Antwerp, the harbor's water level must not exceed 4.35 meters (14 ft. 3 in.); to allow the passage of large vessels, the level must not drop below 4.2 meters (13 ft. 9 in.).

Levels are continuously monitored at the harbor, the river and the intermediary lock. To keep the harbor level within safe limits, the lock is regularly adjusted.

Before the Computer Automation, Inc. Naked Mini was installed monitoring was done manually using level boards and known reference marks – a time consuming, labor-intensive process.

With the NBA system, three strategically placed ultrasonic measuring heads continuously check water levels, feeding this information into the Naked Mini, which processes it and provides digital displays of individual levels and the differences between levels.

The mini and its associated interface electronics are kept behind a main display/control panel in the central lock control room. A two-channel chart recorder, with three integral visual alarms, is installed in the harbor master's office, where it indicates river and dock levels.

Local digital displays are also used at two outside control points to note level differences across the main lock gate. All peripherals are directly slaved from the main display/control panel.

A mini was selected for the job because all design parameters are function of software and need to be simply and inexpensively modified. A variety of output recording and telemetering devices will be added later to support processing via phone or radio links.

Nice III, Opening Saturday, To Focus on On-Line Use

WASHINGTON, D.C. – Practical aspects of on-line information services use will be emphasized during workshops at the Third Annual National Information Conference & Exposition (Nice III) to be held here April 28 - May 3.

"Managing Your Information Crisis: A Multidisciplinary Approach" is the theme of the conference, sponsored by the Information Industry Association (IIA).

A preconference "On-Line Data Base Seminar," to be held April 28, will be a full-day workshop.

A second preconference seminar, "Becoming an Information Manager," will be held Sunday, April 29.

Also offered will be a post-conference seminar May 3 on nonbibliography on-line data bases.

Nice III will also feature exhibits by on-line system operators, data base producers, communications carriers and other suppliers.

For members of IIA or Associated Information Mangers (formerly Program for Information Managers), full registration costs $135, with daily registration at $60. Nonmembers must pay $160 and $70.

The preconference data base seminar costs $75 for members and $90 for nonmembers. "Becoming an Information Manager" costs $90 and $150.

The post-conference seminar costs $135 and 145, respectively.

Information and registration are available through Nice Headquarters, Suite 502, 316 Pennsylvania Ave. S.E., Washington, D.C. 20003.

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Regent® 60
The smart buffered display terminal
In addition to all the features of the Regent 20 and 40, the Regent 60 provides Print Local, Editing, and Transmission Mode keys.
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Regent 60's editing keys allow the insertion or deletion of characters or lines in the screen display. Characters can be inserted or deleted in either the line the cursor is on, or from that line to the end of the display.

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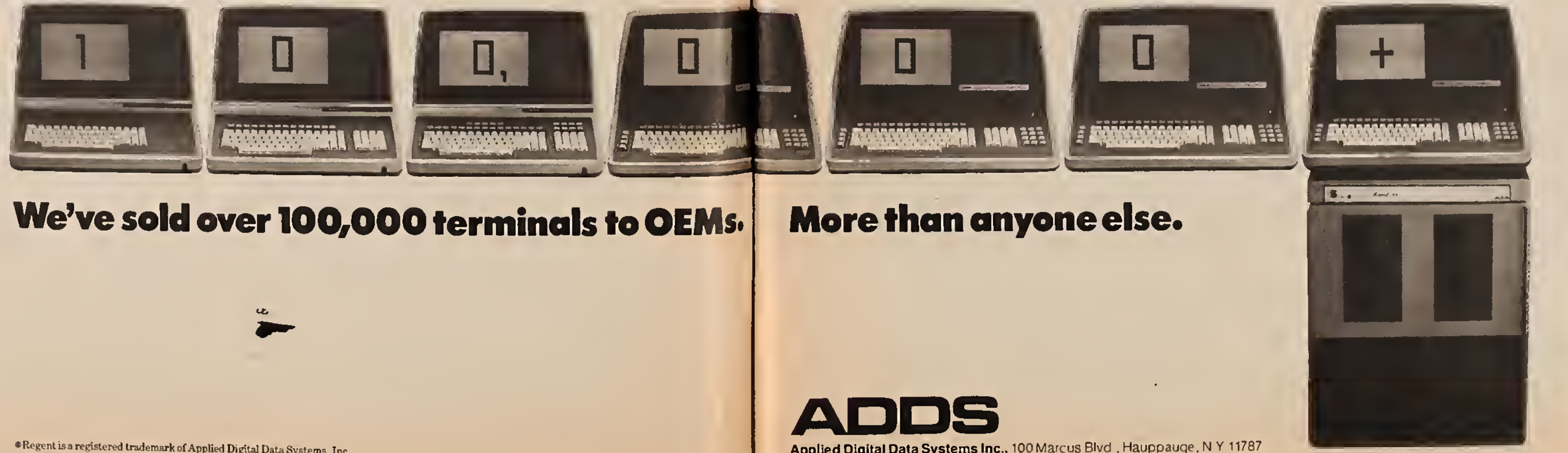

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Job Rating, Service Bureaus Urged

Users Get Tips on Blunting Shutdown's Effects

By Jeffry Beeler
CW West Coast Bureau

CHICAGO – Users can help minimize the potential ill effects of a partial system shutdown by rating the relative importance of each DP job and assigning the most critical applications to a separate group.

At a typical computing site, for example, users could separate their jobs into two groups – on-line and batch – and then assign a higher priority to time-critical on-line applications, advised Dr. Henry Petersohn, a consultant with the U.S. Department of Health, Education and Welfare (HEW).

Thus, during a partial system shutdown, users could readily save their batch processing jobs until later and continue to run their on-line tasks with little or no interruption, Petersohn explained during a session at the recent Interface '79 data communications show here.

Service Bureau Urged

Speaking at a seminar on systems reliability and redundancy, Petersohn offered a series of tips to help users recognize some of the common causes of hardware failure and minimize their possible impact on DP operations. Among his suggestions, Petersohn urged users to delegate part of their DP workload to a service bureau even though they may already have the computing capacity to perform all their jobs in-house.

Users with existing ties to outside time-sharing services will have a ready backup system for their most critical DP applications if their in-house CPU ever undergoes a partial or temporary shutdown, Petersohn pointed out.

"You can also use your service bureau bill to see how your own computing costs compare to those of an outside organization," he added.

Petersohn also advised users to maintain backup versions of their key peripherals and other hardware modules. "If your front-end processor fails, your system is going to go down even if everything else in it is working perfectly," he said.

The need for backup also applies to system software. "You don't need to store your backup software in an iron-mountain facility," Petersohn said, "but you can put a copy in a bank vault or some other place where it can be retrieved if it's ever needed.

In other recommendations, the HEW consultant advised users to install drains beneath their computer room flooring. Fires themselves seldom cause extensive damage in a typical DP room because most sites are equipped with effective automatic sprinkler systems, he said.

"But when the fires are extinguished and the sprinklers are turned off, where does all the water go? That's right, it collects under the computer room floor, where all your wiring and electrical circuits are placed.

"If that happens, the water will short every circuit in your site."

'Looking Into '80s' Set as DPMA Theme

ATLANTA – "Looking Forward Into the '80s" is the theme of the Data Processing Management Society (DPMA) Region 7 Conference scheduled here May 16-18.

H. Wayne Nelson, manager of national accounts marketing and director of customer executive programs for Burroughs Corp., will deliver the keynote address. The conference will be held at the Sheraton Hotel.

Additional information is available from Floyd Harris, Life of Georgia Co., Life of Georgia Tower, Atlanta, Ga. 30308.

Smith, Privacy Expert, Plans Day Briefings

WASHINGTON, D.C. – Robert Ellis Smith, editor of *Privacy Journal* and author of the book, "Privacy: How to Protect What's Left of It," will hold a series of one-day briefings on privacy.

Smith is a frequent speaker, writer and congressional witness on privacy issues. The briefings will be held in Washington, D.C., New Orleans and San Francisco on May 24, May 31 and June 11, respectively.

More information on the briefings is available from Deborah Saunders, Pottinger & Co., Department PJ, 1300 19th St. N.W., Washington, D.C. 20036.

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Workshops to Cover Personnel Productivity

ROCKVILLE, Md. — Personnel productivity in data processing will be the focus of a series of five-day workshops to be held from June to November in various parts of the country by Keston Associates.

The courses will offer a comprehensive review of the key factors bearing on the management and supervision of DP personnel and the forces that lead to improved staff productivity, a spokesman stated.

Session topics will cover personnel selection, assignment and scheduling; measurement and evaluation; the basic psychological concepts of learning, motivation and perception; and supervision.

Career development, including salary administration and turnover control, and organizational dynamics will also be covered, the spokesman said.

Dates and Places

The workshops will be conducted in Jackson Hole, Wyo., June 4-8; in Annapolis, Md., July 23-27; in the Outer Banks of North Carolina Aug. 20-24; in Lake Tahoe, Nev., Sept. 17-21; in Washington, D.C., Oct. 15-19; and in Fort Lauderdale, Fla., Nov. 26-30.

All of the courses will be taught by Dr. Robert Keston, who has an extensive background in behavioral psychology as well as 18 years of experience in data processing, the spokesman said.

Session fees are $695 per person; class size is limited to 30 students. Additional information on the courses is available from Keston Associates, 11317 Old Club Road, Rockville, Md. 20852.

Micrographic Congress Set In Paris Starting Sept. 24

PARIS — The latest micrographic techniques and applications will highlight the 11th International Micrographic Congress (IMC), a four-day conference set to open Sept. 24 at the Palais des Congres here.

IMC '79 will present more than 25 sessions and panel discussions including a session on the future of micrographics that will review market trends in Europe, the U.S., Asia, Africa and eastern countries, an IMC spokesman said.

Technical specialists from 16 countries are expected to participate in the conference, which will feature simultaneous translation of all presentations into English, French and German, according to the spokesman.

Scheduled to run concurrently with this year's IMC conference is the International Exhibition on Data Processing, Communication and Office Organization (Sicob). Sicob will feature office equipment exhibits, including the latest applications of micrographics.

A $280 registration fee will cover all IBM documents proceedings, attendance at a reception and admittance to the Sicob exhibition.

Additional information is available from IMC, P.O. Box 22440, San Diego, Calif. 92122.

Price to Head DPMA Branch

PARK RIDGE, Ill. — Donald E. Price has been elected president of the Data Processing Management Association (DPMA) Education Foundation.

Price is dean of computing and information sciences at Sierra College in Rocklin, Calif., and has served as DPMA's vice-president of education activities since last fall.

Price, who lives in Roseville, Calif., holds a B.A. degree from the University of the Pacific and an M.S. degree from the University of Oregon.

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Itel Users to Meet

ST. CHARLES, Ill. — A group for users of Itel Corp.'s Advanced Systems — called the Cooperative Holders of Itel Computing Equipment (Choice) — will hold its first meeting April 26-27.

Approximately 150 users are expected to attend the meeting, which will take place here at Pheasant Run Lodge. Choice is Itel's first users group.

The meeting will feature workshop sessions in six areas: management/administration, software, futures, communications, operations and applications, according to Choice President Denton E. McCormick.

More information on the meeting is available from Christine Tencza at Itel, One Embarcadero Center, San Francisco, Calif. 94111.

Technology Merger to Be Studied

CHICAGO — The technical, organizational and economic impact of the merger of data processing, communications and office automation will be examined at a conference to be held June 18-20 at the Radisson Hotel here.

Sponsored by Infotech International, Inc., the conference will include sessions on "Decentralized Information Systems," "Integrated Office Systems," "Electronic Mail and Message System" and "Data Communications Networks."

Following the three-day meeting, a tutorial dealing with "The Office of the Future" will be presented June 21-22 to cover the economics of automating the office, functions within the office and behavioral and managerial issues.

The combined fee for conference and tutorial is $1,200, with discounts available for early registration and multiple bookings. Individually, the conference costs $785; the tutorial, $530.

Infotech International is located at Suite 328-9, 234 E. Colorado Blvd., Pasadena, Calif. 91101.

Calendar

April 25-27, Dallas — **1979 ADR/Datacom Users Conference.** Contact: Janie Walker, Applied Data Research, Inc., Datacom Division, 3707 Rawlins St., Dallas, Texas 75219.

April 30-May 2, Washington, D.C. — **First Annual International Conference on Computer Capacity Management.** Contact: The Institute for Software Engineering, P.O. Box 637, Palo Alto, Calif. 94302.

May 14, New York — **Computer Graphics 1979.** Contact: AUI Graphics, 1701 K St. N.W., Washington, D.C. 20006.

May 23-24, New York — **The IBM Impact on Distributed Data Processing.** Contact: Gwendolyn Thomson, The Yankee Group, P.O. Box 43, Harvard Sq., Cambridge, Mass. 02138.

The CW Calendar generally appears in the first and second issues of each month; events are listed a month in advance.

All conference announcements should be sent to Calendar, CW Editorial Department, 797 Washington St., Newton, Mass. 02160, at least six weeks prior to the month in which the event is slated to occur.

Because of constraints, regional conferences cannot be listed.

PROBLEM:

WESTLAW is West Publishing Company's answer to a lawyer's plea.

It offers direct access to a vast electronic library—the tens of thousands of state and federal cases that West, a leading publisher of law books, have in their St. Paul computer files.

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Ironically, WESTLAW's far-reaching success posed a problem: could data communications keep pace with its rapid growth coast to coast?

Before adding full text printouts to the service, for example, West wanted to be sure that lines and terminals could handle the longer messages efficiently.

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Editorial

Slimmer Opportunities

For years the computer industry has been a job generator, gobbling up almost anyone with even minimum training. However, that appears to be changing, as documented recently by statistics from the Bureau of Labor Statistics and educational surveys [CW, April 19].

Several factors seem to be contributing to this state of affairs, which has wide-ranging implications.

The first trend that may lessen the need for DP professionals in the future is the increasing production of people familiar with computers. In the infancy of the industry, few people were trained in computer use; now computer familiarity is part of many business, medical and even liberal arts courses.

Secondly, systems are becoming accessible to non-DPers. Most recent announcements of major computer systems have stressed features that make them easier for people who are not programmers or systems analysts to use.

The trend is clearly toward having the ultimate user of the system write the programs and systems they need, rather than forcing them to have their desires translated by computer people into jargon the machine understands.

In addition, the job of programming itself is becoming more structured and automated, decreasing the amount of time that has to be spent on development projects. (Some of you in the trenches working on projects estimated in "man-decades" might have a hard time swallowing that, but the trend is clearly evident.)

Meanwhile, the personnel shortages of the past have driven up salaries. These high salaries have induced many people in colleges, universities and trade schools to look to DP for future job opportunities.

All these trends point to a possible glut of computer personnel — not tomorrow, not next year, but certainly within the next two decades.

The implications for those already in the field are enormous. Many people in computing are young and expect to be employed for 30 or 40 more years. Toward the end of their careers, they will be competing with an enormous pool of talent that often will be better trained, if less experienced, than they are.

For those entering the DP field, the implications are even greater. Lured by extremely high salaries and the prestige which goes with the territory, they may find the opportunities not as great as they had been led to believe.

Opportunity may not be the only decreasing aspect of DP. To date, the computer field has offered a great deal of mental and intellectual challenge, but this may fade as the field becomes more structured and as the educational requirements for entry become greater.

Everyone in the computer field should be aware of these trends and the implications for their futures. Becoming more aware of the business around you is one way to start, and this may offer growth opportunities outside of the computer center into more line management-type positions.

At the same time, educators need to become aware of the changing job picture to develop students who, while aware of the power and usefulness of computers, are more oriented toward other — perhaps, in the long run, more fruitful — occupations.

Data Past

Five Years Ago
April 24, 1974

CORVALLIS, Ore. — In an effort to discredit the state's use of an IBM 370/158 for educational time-sharing and demonstrate the fallibility of IBM's OS/MVT operating system, a state employee took control of the Model 158 located in the state Department of Motor Vehicles (DMV) in Salem via a remote terminal here. After accessing the DMV files, he deliberately put the system into an unrecoverable crash.

The takeover culminated a series of disputes between Oregon Department of Higher Education and higher administrative officers, including the Legislative Fiscal Office, regarding the role of IBM in the state's DP future.

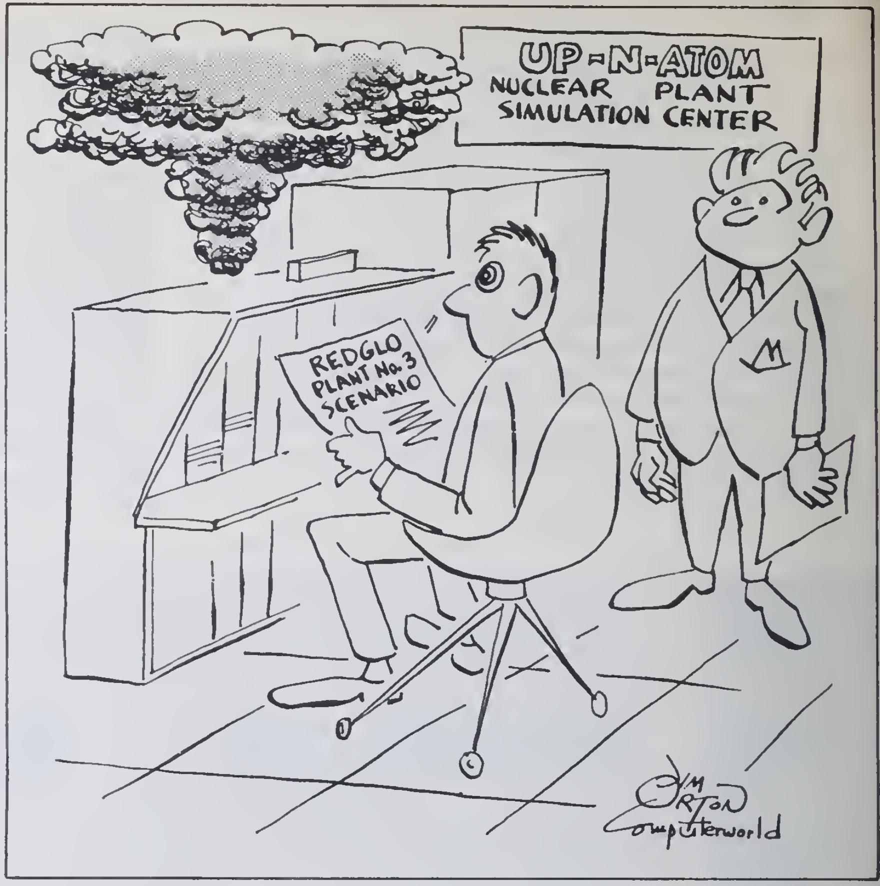
— — —

SALEM, Ore. — Strict security measures were instituted to prevent recurrence of the incident in which a remote terminal user gained control of the state department of Motor Vehicles IBM 370/158. These measures included procedural changes relating to password definition and access, and the shelving of a plan to use the OS-based time-sharing capability of the 370/158 to support higher education time-sharing student users.

Eight Years Ago
April 28, 1971

WASHINGTON, D.C. — Consumers and credit investigators received extra protection against the harm done by inaccurate and outdated information in data banks because of a law which took effect Sunday, April 25, 1971.

The Fair Credit Reporting Act, first proposed more than two years before by Sen. William Proxmire (D-Wis.), was passed in 1969 by the Senate but ignored by the House. It finally was approved when the Senate attached it as a rider to the Foreign Bank Secrecy Bill in the fall of 1970.



Letters to the Editor

'Business Science'?

"Statistics Foreshadow Employment Crunch for DP Grads by 1985" should motivate a change of direction in the world of academia. There has been far too great an effort to train so-called computer science students in highly technical data processing subjects while minimizing the management and administrative aspects of systems and data processing.

No one can doubt that DP professionals must be highly trained in the technical aspects. However, as more and more top-level managers and executives question the results of DP in relation to its costs — and often, its confusion — is is becoming more obvious that business knowhow is also needed.

Perhaps a name other than "computer science" is needed, one that reflects a combination of the technical and administrative facets of DP. How about "business science," "systems science" — or any name which does not reflect an exotic idealist with littel regard for the profit picture of his employer?

Richard A. Katzman
New Cumberland, Pa.

IFs and Awful Bytes

It was a surprise to read that Ed Yourdon is conceding the failure of the first "structured revolution" [CW, April 9]. Already he is mapping the strategy for the second.

I have seven books on structured programming, including Yourdon's. Now I know at least as much on what's wrong as what's right about it. Machine utilization means nothing to the authors of these books. All of them are emotional about the horrible rats' nests of GOTOs found in old programs.

Have you seen the "rattlesnake swamp" in some of the new programs? Nobody but nobody ever went deep into the swamp of nested IFs without getting an awful bite, not to mention thousands of awful bytes.

Let's at least save the forward GO-TO.

Clyde E. Miller
Lisle, Ill.

Clarification Provided

In "GSD-DPD Rivalry Hurting Users" [CW, March 19], certain remarks were attributed to me concerning the relationship of IBM's Data Processing Division (DPD) and General Systems Division (GSD) which might most kindly be described as a serious misinterpretation of what I actually said.

Clearly, at Infotech International, Inc.'s recent conference, "IBM: The Next Five Years," I suggested that competitive rather than complementary systems development on the part of DPD and GSD will lead to problems for the IBM customer. However, nowhere in describing the DPD/GSD relationship did I say that "instead of working together, however, the two divisions usually fight tooth and nail for a potential customer" and nowhere did I say that "if one [side] gains an upper hand in its negotiations with a would-be client, the other side complains bitterly to IBM's corporate management, which usually tries to resolve the dispute by ensuring that each division receives a roughly equal 'piece of the action.' "

Indeed, to have said such things would be totally dishonest, because I do not believe either statement to be true.

In addition to misinterpreting my remarks, *Computerworld* also left its readers with the impression that, since I am a former president of Share, my remarks were sanctioned by Share. In fact, at the outset of my presentation, I took pains to dispel that impression.

Edward J. Farrell
Old Greenwich, Conn.

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Reader Commentary

Directions of DP Auditing Now Changing

By Jay L. Allen
Special to CW

Having visited with hundreds of corporate leaders, it seems most apparent that some changing directions for DP audit and internal audit are quickly emerging. A few companies are providing leadership in evolution, some are considering progressive modifications and some are content to utilize the DP auditor as a programmer, while many are still contemplating an original DP audit function.

While the DP audit profession is relatively new, there are a few specialists with 12 to 15 years of experience. In the earlier years, most DP auditors came out of the internal audit environment, acquired or wrote some audit software and began the process of acquiring DP knowledge.

While this approach is still used, the bulk of today's companies look first for solid hands-on experience in programming and hopefully DP operations. They feel that it is far easier to teach or acquire good audit techniques than it is to acquire solid DP knowledge.

Therefore, the preferred entry into this field is coming out of data processing organizations and the hoped-for emphasis is normally on business/financial applications with some good exposure to accounting and data center operations. While this approach is predominant, however, the demand in the field is bringing candidates out of a wide variety of disciplines.

Career Paths

Two of the major areas which are undergoing change are those related to career paths and level of salary. All of the more qualified DP auditors will want to discuss career paths following a good audit performance.

The majority of companies today seem totally unprepared for this discussion and usually wind up addressing the subject in very general and vague terms. While it is true that in new start-up functions a company will not have a track record in this area, it still behooves all audit managers to be prepared to address this subject in terms as explicit as possible.

Today's DP Auditor must also share a part of this responsibility by asking himself, "Where do I want to go?" However, many seem to leave this important subject to the companies' ingenuity.

One progressive company states on the front end that it expects DP auditors to be promotable into higher responsibilities after 24 months. Some recent examples of promotions in that company as well as others: one top DP Auditor was promoted to a general auditor's position; another was assigned to coordinate the design and implementation of a completely integrated accounting financial system; another was named vice-president of data processing; another was promoted to assistant to the president; another was named director of internal audit.

YEARS OF EDP AUDIT EXPERIENCE	AVERAGE PRESENT SALARY	NUMBER OF CANDIDATES	MOVE FOR 21.5%
Entry Level	$19,000	3	$23,085
1	19,250	4	23,388
2	24,882	17	30,232
3	25,476	21	30,953
4	28,375	22	34,475
5	28,454	16	34,572
6	29,000	12	35,235
7	29,500	4	35,843
8	25,800	5	31,347
9	26,000	4	31,590
10 or more	29,500	4	35,843

Salary Levels for DP Auditors

Salary Levels

Another area giving most companies a real problem is salary levels for the DP audit function. Many audit managers are struggling with this subject and often wind up trying to equalize the salary structure between internal and DP Audit.

This is most unrealistic, since the DP auditor is expected to have most of the same qualifications as the internal auditor but also have a good working knowledge of programming and DP operations, which makes for a higher level of capability.

This means, of course, that the DP audit salary structure should be primarily compatible with the DP salary structure.

In response to many queries regarding salary levels for DP auditors, we have compiled from more than 100 actual files (as of Dec. 1, 1978) the above table, which reflects the average present salary vs. years of experience in DP audit. We are confident that this table reflects the most accurate information

(Continued on Page 28)

The Human Connection

Agent Defeats Goals Of Airline DP System

By Jack Stone
Special to CW

I had hoped that my recent overbooking and lost baggage traumas were the end of my misadventures with the commercial airlines. But all was once again despair when I entered the ranks of the maltreated standby whose handling by the passenger agents sometimes makes a near-mockery of the computer-based reservations system.

My most recent engagement went like this: On the last leg of a business trip to the Midwest, I was scheduled to fly the friendly skies of United. But, as you probably know, these skies turned hostile because of the carrier's mechanics' strike.

So I found myself at Chicago's O'Hare Airport, a miserable standby sharing dark thoughts about the airlines along with thousands of others.

Well, American Airlines wait-listed me on its next three flights to Washington, D.C. But this service is limited since wait-listees run a very poor second to overbookees.

I learned this when I heard one agent say, "Hey, we're doing real good today. The computer display shows we're only 20 seats oversold!"

However, I was impressed with the company's red-hot algorithm for handling overbooking because agents found three empty seats at take-off time, just enough to accommodate the three overbookees that did show up — but not enough to handle any standbys.

My look of dejection must have impressed one iron-hearted agent who, out of the wild blue yonder, asked if I wanted a first class reservation on a plane two flights hence. I told him that, if available, I would take space at the outboard handholds on the starboard wing to get home.

Mixed Emotions

Having many hours to kill, I decided to adjust reservations on a very complicated future trip which also involved a canceled United flight. Seems as though the only service remaining to historic Toledo was on something called Air Wisconsin. I had mixed emotions when I found its counter empty — an unsettling contrast with the mob scene going on at other airlines' counters.

I went through my entire itinerary with an agent who told me

(Continued on Page 28)

The Taylor Report

NCR Maintenance Plan May Prove Unworkable

By Alan Taylor
Special to CW

NCR Corp.'s on-and-off actions regarding reinitialization fees for users who buy non-NCR equipment were recently compared with IBM's past actions concerning add-on memory [CW, April 2]. Both vendors apparently took these positions to save face after their maintenance practices were publicly challenged.

Now NCR, like IBM before it, has pulled back and said it will charge only for time and materials.

I would let the matter rest except that NCR's false reasoning in attempting to justify a 50% maintenance price jump leads me to believe that its compromise could prove unworkable.

The 50% maintenance price jump is reportedly applicable to all NCR Century equipment as soon as it becomes eight years old. Equipment built from 1968 to 1971 is therefore affected. By next year, more than half of the original equipment will qualify for the across-the-board price hike of 50%.

As the value of the equipment drops, the maintenance price may become the most important cost factor for people using the Century systems. A 50% jump coming now, or in a year or two, could destroy the market value of these useful computers. Thus it is necessary to examine NCR's justification for the move before simply accepting the increase.

NCR argued as follows: "When a system becomes eight years of age, NCR feels that the additional cost to maintain this product requires the customer make two decisions:

"1. Have the equipment overhauled by the local NCR office.

"2. Pay an additional 50% upcharge for maintenance service coverage.

"If a customer does not choose to have the equipment overhauled, the 50% maintenance upcharge is automatic. In most cases, with 655 disk drives, customers have chose [sic] to upgrade their systems.

"Increasing at a much greater rate than our maintenance service coverage has been the hourly charge and especially the cost of parts. Our present hourly rate for 8 a.m. to 5 p.m. service is $56 per hour.

"The average cost of a plug-in board is about $700; the cost of

(Continued on Page 30)

Letters to the Editor

NCR Pricing Jibes With Competitive Market

"NCR Haggling Over 'Fixed Price' Gear" [CW, March 12] pointed out that at least one computer company is willing to price its gear according to the competitive nature of the market (i.e., letting the laws of supply and demand control its pricing structure). Considering the economic basis of our country, this makes sense to me.

However, in the editorial the following week, *Computerworld* claimed that NCR Corp. is penalizing its "loyal" customers by being competitive. CW pointed to the statistic that 40% of NCR users assume NCR prices are "firm."

I would be interested to know how many people feel new car prices are firm and are dumb enough to pay the list price on an automobile without at least looking at the competition, let alone haggling with the salespersons.

If I pay $5,000 for something you paid $8,000 for, you shouldn't feel cheated. You should feel embarrassed.

Bob Upshaw
Berkeley, Calif.

DP Group in Mexico

"Mexican DP Association Resembles Fraternity" [CW, April 12] stated that the Academia de Mexicana de Informatica Asociacion Civil (Amiac) "is the only professional computing society in Mexico at present." It also stated that Amiac is "more like a club or fraternity than professional societies found in the U.S."

The Data Processing Management Association (DPMA) has had a chapter in Monterrey N.L. Mexico, for several years. This chapter, like others in DPMA, is dedicated to the advancemnt of the data processing profession. The Monterray Chapter is within Region III of DPMA.

In order to assist in the expansion of DPMA in Mexico, Pedro Barcena was named DPMA International's ambassador to Mexico. Barcena's immediate goals include the addition of four more chapters in Mexico and the translation of professional material from English to Spanish

The names and addresses of persons to contact for more information regarding expansion of our professional association in Mexico are:

- Pedro Barcena, Plaza de Venecia No. 107, Valle de San Angel, Garza Garcia N.L., Mexico.
- Armando Cerrillo Gomez or Ing. Carlos Martinez, Dinamica, S.A., P.O. Box 3000, Monterray N.L., Mexico.
- Luis H. O'Hara, Bancomer, S.A., Apartado No. 9 Bis, V. Carranza 44, RFC BAN-771118, Mexico 1, D.F.

Charles W. Davis
Region III Vice-President
DPMA
El Paso, Texas

Two Inaccuracies

I was pleasantly surprised at the string of five articles April 2 about computing in Mexico, but was extremely disappointed at inaccuracies stated in several of these articles:

- The Academia Mexicana de Informatica Asociacion Civil is not the only professional computing society in Mexico, as records of the Data Processing Management Association will show. There is also another Mexican DP society, the Instituto de Profesionistas de Sistmas Computacionales A.C., whose members are graduates of the Instituto Tecnologico y de Estudios Superiores de Monterrey (ITESM).
- Another article stated that "only about 200 individuals in Mexico hold degrees in informatics" is, if not false, quite distorted. The ITESM mentioned above has graduated close to 600 students in three bachelor degree programs — computer systems engineering, industrial and systems engineering and administrative computer systems — and has introduced students of other degree programs as varied as agronomy, business and engineering to the use of computers in their own fields. The ITESM also has a master's degree program in computer systems which was begun in 1976.

Even with these additional figures, there is a definite shortage of qualified DP personnel in Mexico that is magnified by the socially devalued career of programming, which is usually relegated to nontechnical and ill-trained people.

Carlos E. Ross
Monterray N.L., Mexico

'Taps' Marketing

The announcement of Itel Corp.'s acquisition of marketing rights to the Transaction Processing System (Taps) appeared in the April 2 edition of *Computerworld*.

Although we at Decision Strategy Corp. appreciate the publicity, we would like to set the record straight. Itel does not have exclusive marketing rights to market Taps in the mainframe arena.

Decision Strategy Corp. is marketing Taps for minicomputers as well, including Perkin-Elmer Corp.'s Interdata minis, IBM's Series/1, Digital Equipment Corp.'s PDP-11, Hewlett-Packard Co.'s HP 3000 and machines from Harris Corp. and Tandem Computers, Inc.

Linda C. Diamond
Marketing Support Representative
Decision Strategy Corp
New York, N.Y.

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DP Dialogue

Notes and observations from the IBM Data Processing Division that may prove of interest to DP professionals

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Virginia National Bank Gets Set for the Future

This Cashflow facility of Virginia National Bank, in a Norfolk supermarket, can offer 75 to 80 percent of the services available in a conventional branch office.

"We're fighting a cost battle. Our projections show that by 1985 it will be very difficult to earn any money unless we make fundamental changes in our consumer services."

David O'Connor is senior vice president, consumer services, of Virginia National Bank, Norfolk, Virginia, which has moved aggressively into the world of online banking. Currently it uses 400 units of the IBM Finance Communication System, including the IBM 3614 Consumer Transaction Facility, installed in 47 locations throughout the state of Virginia.

If the average cost of a consumer transaction this year is arbitrarily indexed at $1.00, O'Connor points out, it will go up to $1.26 by 1985 if there are no changes. So his goal is to channel 36 percent of consumer transactions through the Cashflow system by that year. Cashflow is Virginia National's trade name for its online, customer-operated banking services, available in drug stores, shopping centers, and similar locations.

Meeting that goal will help hold that $1.00 index down to $1.02, O'Connor says, adding that the measure of success is progress toward that goal, not the immediate cost per transaction. "We use a computer model of operations to compare projected to actual costs and transaction volumes, to confirm that Cashflow is on track," he notes. "And we are delighted with our progress to date: 400,000 transactions a month now pass through the customer-operated facilities, we have stayed within our projected costs, and average balances are going up.

"Cashflow centers also offer an attractive alternative to the increasingly expensive construction of conventional branch offices. But beyond the purely economic factors, the shift to online, computer-based banking will position us to cope with rapid shifts in the banking environment and to offer wholly new services," O'Connor adds.

"We're preparing a fundamentally new delivery system for banking services. We're excited about it, and we feel sure our depositors will be too."

Soltex placed this new polypropylene production unit, near Houston, in service during the fall of 1978. When the company needed application software rapidly for inventory, order processing and other basic functions to support its manufacturing and marketing operations, it turned to IBM's DMS/VS.

Soltex Polymer Gets Tasks Online Eight Times Faster with DMS/VS

"Under DMS, we can do an online job in one-eighth the time required to program it conventionally," says Walter S. Fletcher, manager of management information systems for Soltex Polymer Corporation. "On the average, one line in DMS does as much as 50 to 80 lines of COBOL."

Display Management System/Virtual Storage (DMS/VS), an IBM program product, is a simplified programming system for online applications that recently helped Soltex meet an urgent need. A leading producer of polyethylene and polypropylene, plastic resins for a wide variety of applications, headquartered in Houston, Texas, Soltex had to reprogram its basic set of applications when it became a subsidiary of Belgium-based Solvay & Cie S.A.

"We reprogrammed and installed the applications on our IBM System/370 Model 115 with three man-months of effort," Fletcher notes. "Without DMS it would have taken 24 to 27 man-months.

"DMS also helps us minimize maintenance requirements by involving users in the design process, so that the system better reflects their real needs. And we have a closer rapport with users now that they don't wait months for delivery of an application."

Changing the structure of a record or lengthening it by adding fields is easily accomplished under DMS/VS, Fletcher points out. "It does 90 percent of the work of programming this kind of online business system."

DMS/VS converts information from a fill-in-the-blanks sheet directly into executable form. It generates and displays user-defined screen formats, processes terminal transactions, and accesses an existing data base or one newly defined under DMS/VS. Screen formats can be revised and new ones added quickly and easily, without reprogramming.

"DMS generates all the steps required to process or inquire against a file," Fletcher adds. "It is self-documenting and allows very creative design techniques. We can use programmers with experience primarily in the application area rather than a technical staff."

As the cost-performance ratio of the hardware continues to improve, data processing costs are becoming people-intensive, Fletcher believes. Therefore the productivity of people is of increasing importance to management.

"DMS has helped us hedge against rising personnel costs," he says. "We began creating a responsive online Management Information program with an initial staff of two programmer/analysts and one operator. DMS enables us to maintain existing systems and tackle new development work."

DP Dialogue is designed to provide you with useful information about data processing applications, concepts and techniques. For more information about IBM products or services, contact your local IBM branch office, or write Editor, DP Dialogue, IBM Data Processing Division, White Plains, N.Y. 10604.

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Agent Defeats Goals of Reservations System

(Continued from Page 25)

that her computer system couldn't access part of my records. But the agent offered to rebook me if I would take the responsibility of canceling the original reservation.

I gave her my Boy Scout's oath on it and she spent the next 15 minutes writing up the ticket manually. But when it came time to pay, she couldn't take my check because it was written on a D.C. bank and the airline was not chartered in D.C. So this task abended.

I gritted my teeth as I entered the end of a quasi-infinite ticket queue at the American counter. After a virtual eternity passed, I reached the agent and went through my travel plans all again.

"Sir, I can't seem to find your reservation in our computer. Did you make it through American?"

"No, ma'am, Air Wisconsin."

"Sir, we do not access Air Wisconsin's records in our computer. You will have to go back to them for your ticket."

"Ma'am, I will cut off my left arm and lay it on this counter if you send me back to Air Wisconsin."

"Well, in that case, I'll make a new reservation for you here if you take the responsibility of canceling the old reservation."

I swore to her on the heads of my Micropolis disk drives that I would do so and got the ticket.

I returned to the departure area to stand by for the next flight, but there was no space for me. So I asked the agent to issue a ticket for my first class reservation on the next plane.

"Sir, the computer does not show any reservation on the next plane. Did you make it with American?"

"Ma'am, I made it right at this spot two flights ago and if you do not give me my ticket, I will take a hammer and break both of my kneecaps right in front of this counter."

"Sir, our computer is infallible. It is incapable of making mistakes. Obviously, you did not make the reservation."

"Ma'am, I have changed my mind. I will set myself on fire in the passageway to the plane unless you issue my ticket this very second."

"Well, I'll check on it again, but you know . . . Oh, dear! Here it is! Would you believe that I was asking for the wrong flight number?"

Audit Directions Changing

(Continued from Page 25)

which is available today for the DP audit specialist because the data is taken from current candidate files which are representative of banking, insurance, manufacturing and other sectors.

In the table on Page 25:

- "Years of EDP Audit Experience" means only those years specifically in this field and does not include prior experience in DP, accounting, internal audit or all three.
- "Entry Level" is that candidate who has experience in systems programming, accounting, internal audit or all three and wants to enter the field.
- "Average Present Salary" means the actual base salary today.

The experienced DP audit candidates which we have placed in the past two years have averaged moving for salary increases of 21.5%. While this reflects the average increase for a new career opportunity, there are many other factors which enter into consideration — namely, existence of recognized career paths, the degree of importance which top management places on audit and the level of the candidate's experience other than DP Audit.

Reason for Decline

The average salary for eight to 10 years of experience shows a dropoff. We feel this to be quite accurate for these reasons:

1. Most companies view the DP auditor as having a two-to-five-year responsibility, after which time they want him to be promotable into other levels of corporate opportunity.
2. For those with eight or more years' experience, our information shows that these specialists are the ones who wish to remain in the field (which will have some reasonable uppper salary limits) or may not be easily promotable in their particular environment.

This is the first part of a two-part series. Allen is with Allen Management, Inc. of Oklahoma City, a nationwide recruiter of DP auditors and internal auditors.

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NCR Maintenance Plan May Be Unworkable

(Continued from Page 25)

one disk read/write head is $1,250. As you can see, it would not take many service calls to be able to justify the maintenance coverage."

False Data

Now this simply is using false data. When a plug-in board is repaired, it is not replaced by a new one. That would be technically wasteful.

Instead, while a replacement board may be used to bring the system back into operation, the cost is simply the repair of the faulty board, which is often just a single component replacement. That $700 figure has nothing whatsoever to do with the cost of maintenance.

NCR policy (which demands that the replaced board become the property of NCR at no charge) keeps the maintenance costs down to board repair, not to board replacement.

About Read/Write Heads

The other quoted cost — that of the 655 disk read/write head — is another matter. NCR has more trouble economically salvaging heads than repairing plug-in boards. The head exchange cost is significantly less than the quoted $1,250 figure.

Moreover, read/write heads only apply to mechanical components, not to electronic ones.

There is simply no reason why the cost of repairing a disk read/write head should have anything to do with the price of maintaining processor units. It is clear that NCR's attempt to justify the 50% price hike doesn't work.

The use of the false maintenance data here reminds me of the 1970 to 1971 arguments *before* IBM withdrew its maintenance policy against add-ons. I wonder if the current reinitialization compromise will keep users satisfied for the coming years.

IBM's engineers at that time reported serious problems maintaining some of the add-on systems. Some maintenance calls apparently lasted 55 hours.

While IBM data indicated that the add-on memory caused additional maintenance, the history since of the same add-on memory has shown otherwise.

Similar false conclusions regarding time and materials needs may make the current NCR compromise tenuous. NCR could decide to drop the compromise if it again tries to restrict its uers' rights to buy good equipment.

Its use of false reasoning this past March regarding maintenance charges leaves me — and should leave NCR users — quite uncomfortable.

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DP Game Playing: He Just Couldn't Quit

By Robert S. Glass

Special to CW

Sociology of Computing

By now, everybody knows about computerized games. From Star Trek to Land War, the concepts and actions associated with playing against or with an electronic beasty have intrigued game-players from Poughkeepsie to Podunk.

That kind of game-playing is usually an in-the-privacy-of-your-home (or retail computer store) kind of thing. Sometimes — perhaps more often than anyone cares to admit — that kind of game playing also occurs time-shared with other, more productively occupied, computer tasks.

And occasionally — perish the thought — game players actually squeeze a few sessions in around the rough edges of an 8 to 4:30 work day. On company time, in short.

David Blast was one of those. Disguised as a production programmer for General MPG, Dave was actually an impish game player who preferred doing battle with Klingons to doing battle with Cobol.

If there was a game to be played on the Marketronics 3PI computer at General MPG's corporate computer center — even a bootlegged one — Dave knew about it. And played it.

Dave resented — sometimes deeply — the fact that his surreptitious sessions were often prematurely terminated by the arrival of a curious manager whose brows furrowed when he saw the unusual displays being generated on Dave's supposedly Cobol-productive CRT screen. With the last of the red-hot Klingons locked in your sights, it takes a person of psychological steel to snap off the power switch.

The problem, Dave felt, had to be solved. And with all the system skills of a knowledgeable programmer, he set about finding a solution.

The responsible, pragmatic soul in all of us probably demands that one obvious solution be considered — Quit Playing Games. It's the right and proper answer to an essentially ethical dilemma.

Dave, as you may have already guessed, quickly rejected that on the grounds that it was No Fun at All. So much for ethics.

Another much more attractive answer evolved slowly as Dave worked the problem back and forth in his mind. The problem, succinctly stated, was Avoid Getting Caught.

Played against this backdrop of antiinstitutionalized thinking was another theme on which Dave had been working: computerized basketball. Why not try out his Avoid Getting Caught philosophy and build a new game at the same time? The idea was no sooner formulated than it was set to coding pad.

The essence of the output of Dave's basketball game was a dynamic output display containing the roster of players for each of the two competing teams. As the game progressed, the human managers at the console could select who started the game, who was substituted and when and which offensive and defensive strategies were to be employed.

The computer, upon receipt of this controlling input, would simulate a result of the offensive/defensive strategies, ultimately recorded in real-time as a score or a turnover or a foul or some other basketball-relevant interium result.

A Flower Blooms

But all of that was fairly obvious basketball output. The curious manager could crucify a guy caught with one of those displays on his screen. How, in fact, could Dave even begin to think he could make a computerized basketball game look like something else?

It is from dilemmas such as these that the flower of true creativity blossoms. The basketball game would continue to play, its output openly displayed before God and Country, with no one the wiser. Its output would simply be transliterated into a superficially sanctifiable, transparent-to-the-player disguise.

An output encryption scheme where both the message and its coded form were meaningful.

A management simulation game. The output would take the form of a management simulation game. Where the rosters would be organization charts. And each box on the chart would represent a player.

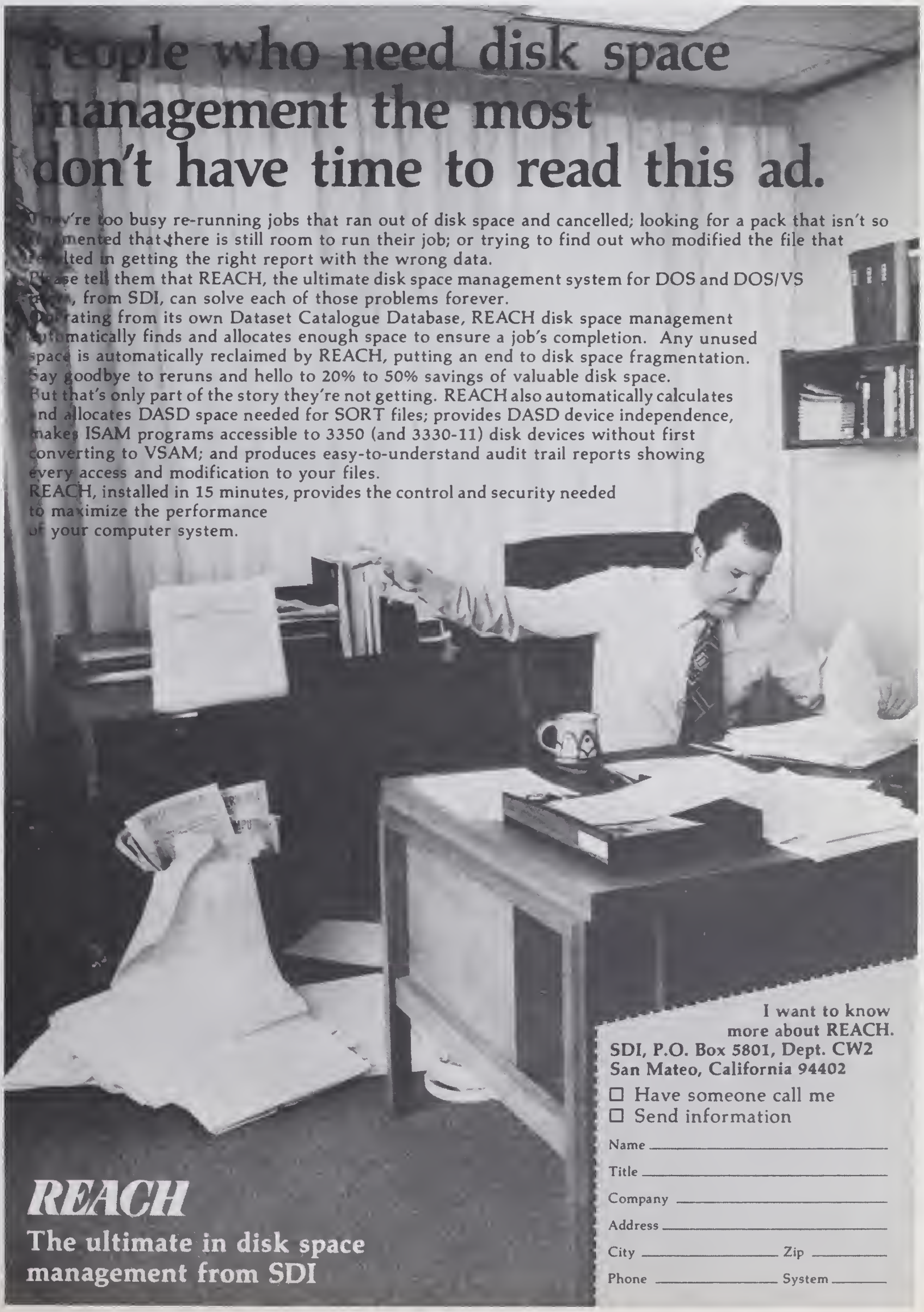
Subordinate to that box would be his potential substitutes.In the box, with the player, coded as an organization number, would be his current data — points, fouls, anything else pertinent. And across the bottom of the screen, proclaimed as a running simulation tally, would be the encoded game score.

The System Works

"What are you doing?" An alert manager would say to Dave.

"Checking out a management simulation algorithm for Industrial Relations" would be Dave's equally alert reply.

Well, the system worked. When I last talked to Dave, he had a six-person league going, playing basketball every day, according to a predefined 40-game schedule.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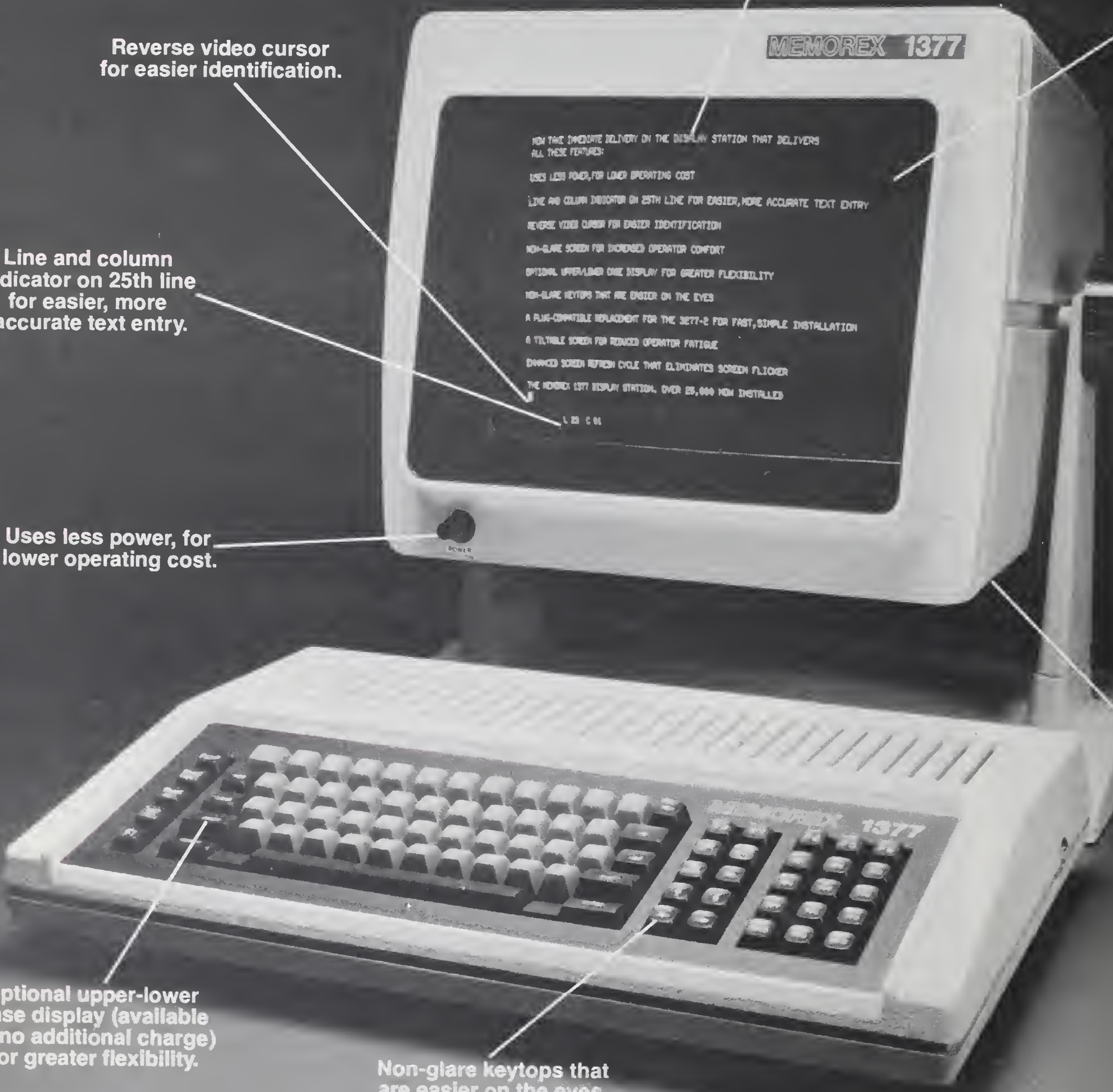

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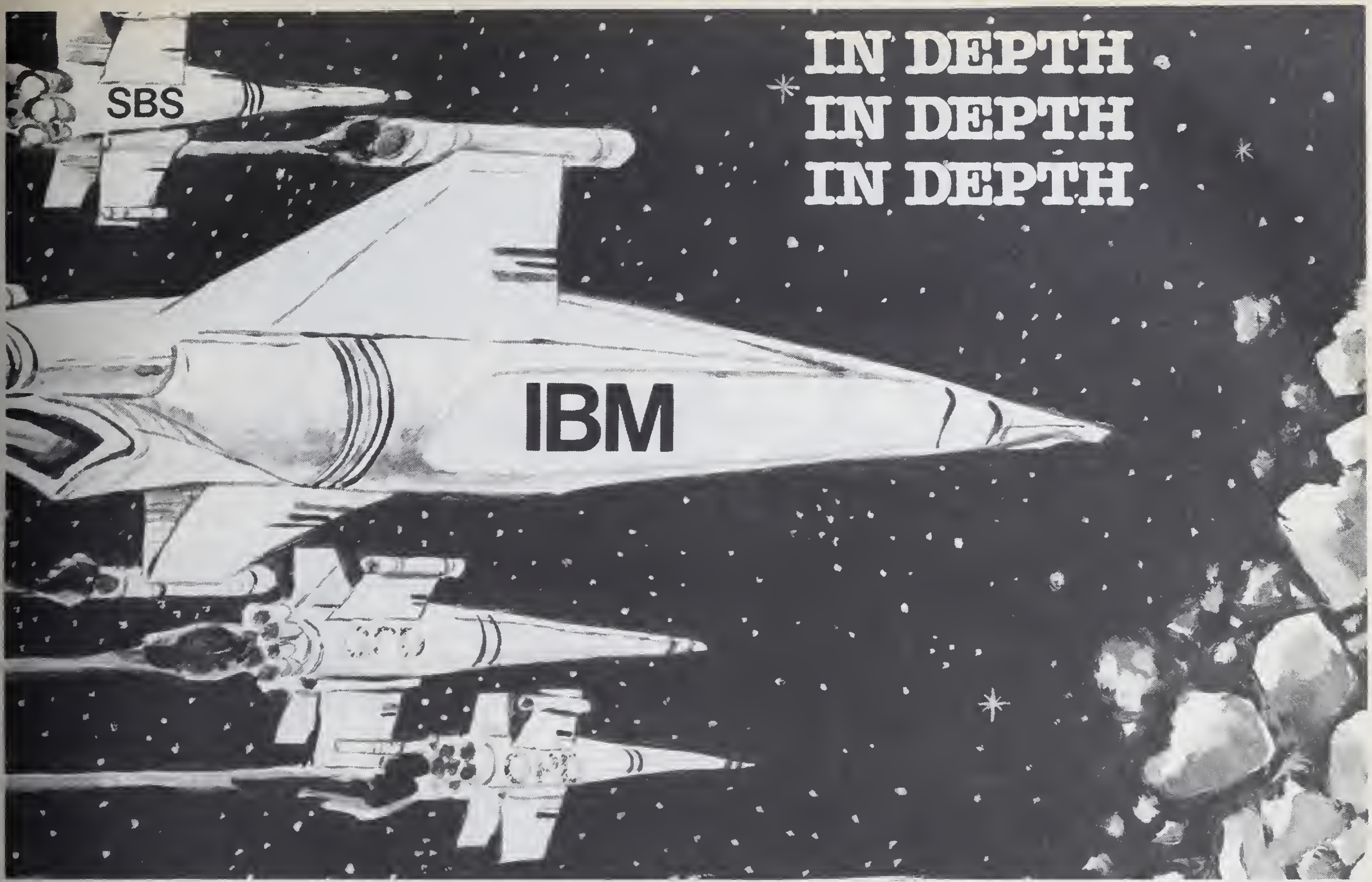
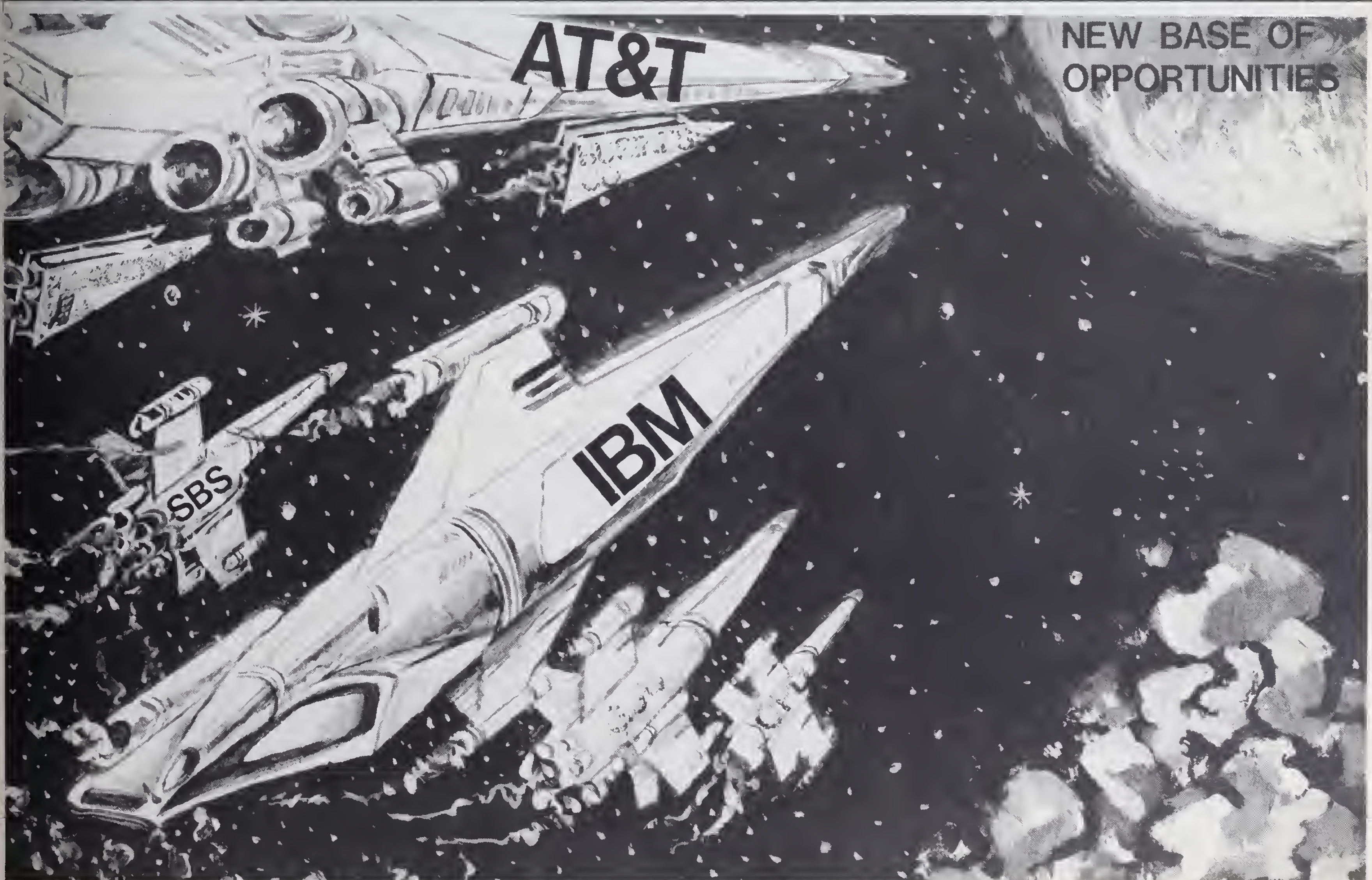


IBM Starfleet: Charting a New Course



By Charles P. Lecht

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IN DEPTH

It is a fair working hypothesis that IBM's "star fleet" (the Data Processing Division, General Systems Division, Office Products Division, World Trade Corp., System Products Division and Federal Systems Division) initiated a significant change of course in nearly 1975.

Having ruled the world computer systems marketplace since the late 1960s, IBM corporate management achieved true superstardom in the early 1970s, some 20 years after it first guided its fleet of businesses into the computer era, by means of a strategic blend of constancy of purpose with creativity and imagination not often seen to function on such a scale. Then, in January 1975, Frank T. Cary's announcement on Future System (FS) redirection resulted in a shift in the major development thrust of the company and its businesses.

It should come as no surprise that the enterprise responsible for turning out most of the world's computer systems was also expert at using these very same instruments internally to forecast its own direction and new markets of opportunity. Synthesizing increasingly complex world economic, political, psychological and technological data and anticipating new threats and challenges to its mission, IBM's high command demonstrated that it was acutely sensitive to the value of marketplace and competitive intelligence as major factors in charting its future course.

Not too many people seem aware of the consequences to the world computer systems community of the 1975 IBM course alteration; and yet today, IBM's direction prefigures that which will ultimately be taken by the entire information systems industry.

To this point, we foresee all companies falling into the following classes:

- Mainstream — those that configure and manufacture information systems, from data origination through dissemination, including manual as well as automated procedural environments.

An information system should include data acquisition, purification, storage, (applications specific) processing, retrieval, presentation and dissemination facilities. Its components are hardware, hardware programs (software and applications), people, people programs (procedures, documentation and so forth) and "packaging." Its impact is technological, economic, political (interorganizational) and psychological (intraorganizational).

These mainstream companies will purvey these systems and/or sell their DP power.

- Component — those that manufacture parts of an information systems environment, usually hardware and/or software.
- Device — Those that make processor logic-based items, some of which may be parts of a component (or components themselves) of an information system, although not necessarily. Included are all devices that have some form of artificial intelligence usually through incorporation of microprocessor logic.
- Consulting — those that market the services of one or more persons individually and/or severally (the work could involve high-level systems engineering and include all aspects of information systems endeavor at one time or another).
- Fringe — those that provide specialized products such as supplies or facilities.

While this classification system may not in itself seem too revolutionary when compared with today's, its corporate constituencies will be radically altered.

While I see but a few companies in the mainstream businesses in our future, there will be great numbers in the component, device, consulting and fringe areas; many more than now exist. Some may host "product/service lines" involving items taken from several of these areas they may make a component, provide skilled people and so forth. But the business classifications given relate to essences or main areas of endeavor.

End use of the company's output will be the final determinant of its classification.

IBM's main thrust will be to capture as much as possible of the world mainstream business while controlling as many of the others as practical through direct and indirect influence. It will do all of this by restructuring itself as a more flexible and adaptive cluster of companies and through initiation of joint-venture-like arrangements (including part ownership) with many other companies.

The star fleet is *indeed* changing while turning.

Some companies seem oblivious to the fact that IBM altered its course at

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all. Their product plans betray their management's maladaptive instincts for following the leader whatever it does.

Once having achieved ruling status in the early 1970s, IBM excited a measure of concern within the U.S. Justice Department by virtue of the size of its arsenal of competitive weaponry — products, services, plants, cash and so forth — and its practices.

Swift changes in "traditional" business boundaries, such as those that have led to the collision of the communications and computer systems technology sectors, brought IBM into conflict with yet another heretofore benign superstar: AT&T. Equally fast-changing product profiles within the evolving information systems business have also resulted in friction between the great giant and the other micro/-mini/maxi manufacturers and service companies.

At the same time, in the growing din of protest over IBM's practices were born new business opportunities based on the emerging ease with which other companies could introduce IBM-compatible or replacement products. (It would, for example, be hard to rationalize the success of such companies as Amdahl Corp. without acknowledging the piggyback ride it took on IBM's hardware, but primarily software, R&D dollars.

IBM Keeps Cool

Despite all this turbulence, IBM's high command seems to have remained very cool, but there were a few instances of overreaction and bad timing. For example, the 303X was underpriced at introduction, leading to a huge order backlog which stimulated business opportunities for the plug-compatibles with shorter delivery schedules.

The continuing evolution of IBM's products, services, corporate profile and business practices may soon necessitate inscribing the Justice Department in a course in Scholastic philosophy as such issues as matter vs. form, accidental vs. substantial attributes and essence vs. existence — as they pertain to an industry steeped in metaphor and undergoing rapid change — are debated. Simple concepts like location (where a system begins, ends or even *is*) have new meanings, if they have meaning at all, in an era when electronic pathways encircle the globe and distribution's the name of the game.

Within business boundaries so blurred both in product and practice as to cause chaos in the separations of companies and their charters, great opportunity traditionally has existed. For example, the IBM/AT&T conflict is based on sincerely believed charges of territorial encroachment lodged by each against the other.

No doubt the swiftly changing nature of the U.S. computer industry is heavily influenced by the nature of its product, and many business opportunities as yet not apparent will open in the lawless "no-man's-lands" created by such territorial disputes.

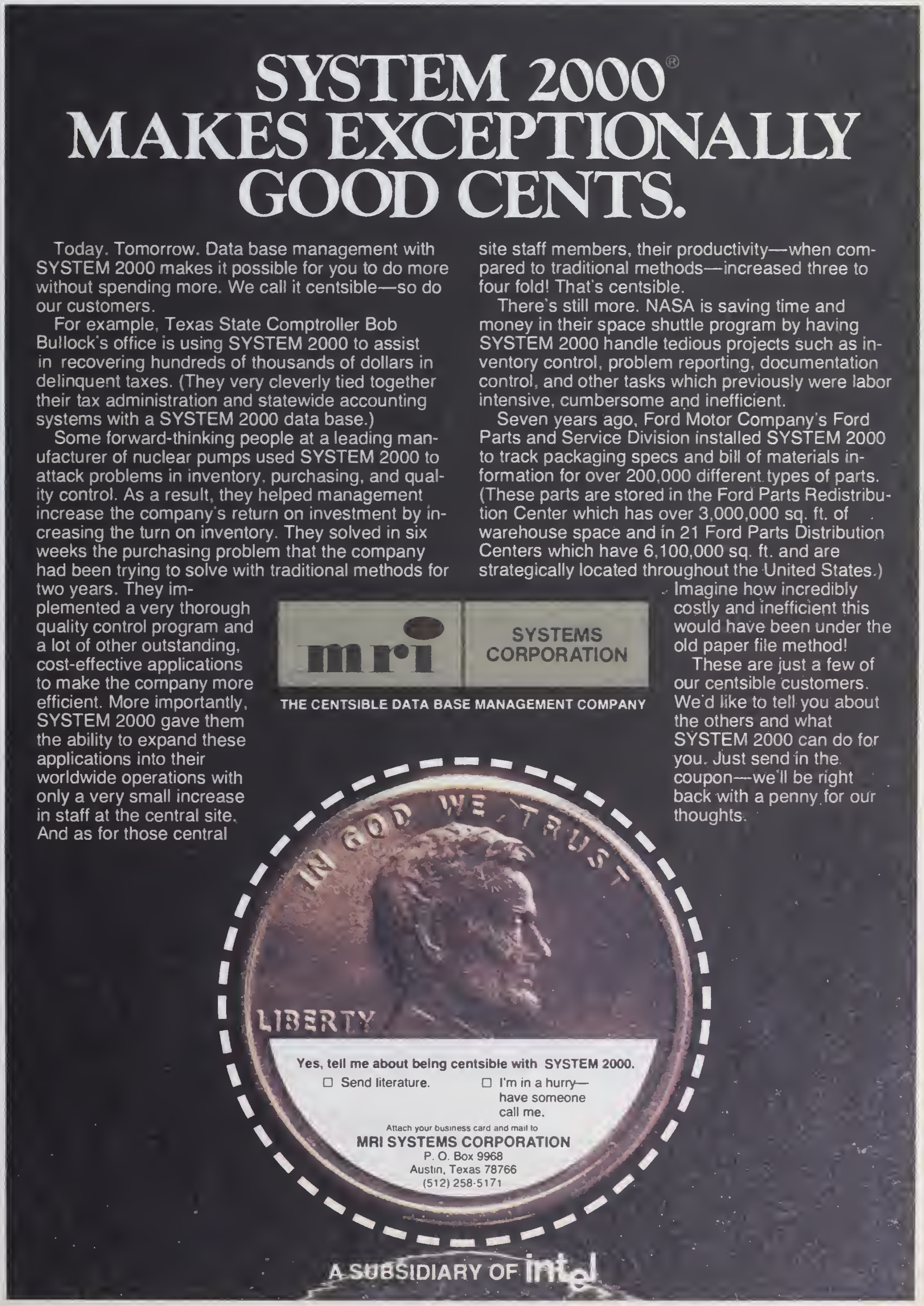
This will be the year when today's information systems companies, unprepared to produce full information systems, will falter, either radically changing their businesses to the component, device, consulting or fringe sectors or getting out of the industry. Those that succeed will have accepted the fact that the process of information systems creation involves mastering a metaphor for the instrumentation of man and his environment.

The degree to which systems can be made to retrofit both will affect profits. But retrofitting implies more than hardware instrumentation, and therein lies the rub for most of today's so-called information systems manufacturers. With the exception of a very few, they are really unprepared to handle the "other side of hardware" — that is, consulting, training, customer service and software.

With classic processor technology available today from miniaturized VLSI chips through transcontinental networks, future sales of discrete systems will be greatly affected by the availability of alternative sources of DP power without the same capital investment heretofore necessary. Already staking claims for the rights to provide such power in the U.S., if not complete information systems themselves, are Satellite Business Systems (SBS), General Electric Co., Xerox Corp., AT&T, General Telephone & Electronics, ITT and others. IBM owns 47-1/2% of SBS.

Reasons for Shift

One could argue, I suppose, that the waves of technological change that have swept over the entire information systems community could by themselves have accounted for IBM's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SPERRY UNIVAC

SPERRY UNIVAC IS A DIVISION OF SPERRY RAND CORPORATION change of course. The "if-sold" value of computer systems technology in the mid-to-latter '70s has been approaching decay rates similar to those of radioactive isotopes with half-lives of one to two years.

Thus IBM's need to maintain corporate momentum might be viewed as the primary stimulus for its change of course. Its revenue objectives call for increases of $2 billion in 1978, $3 billion in 1979 and $4.5 billion to $5 billion in 1980.

What is so spectacular about this change of course is that so far it has not seriously compromised yearly corporate objectives. In view of miscalculations like FS and the timing of 370 systems introduction this was no mean feat.

There could be no more persuasive sign than this that, since IBM changed course, it has had a strong and determined hand on the tiller. History is replete with stories of corporations whose momentum was such that management could not change its course or if so, only in uncontrolled ways. It is my observation that, on balance, IBM may have been as responsible for *creating* its own "necessity" for change as it was reactive to exterior forces, originating in the rapid flux of technology, for change.

Startling Silence

As IBM changed course, its management maintained a startling silence on its long-term objectives. Since 1975, it has deployed so many products as to obscure, at times, which are scheduled for long-term development and which are one-time phenomena. One thing that is clear from this is that great financial resources indeed would be needed by any would-be across-the-board competitor.

In the sense the term is used here, a one-time phenomenon is a product which, however well it sells, has no line of successor systems planned and no easy migration paths to other systems. A company intending to attack an IBM one-time phenomenon marketplace may do so with reasonable chances of success. However, its business will be extremely susceptible to changes in IBM strategy for upgrading and/or migrating its customer base.

Starting with the small 5100 line, we have seen at least 10 major announcements in the past three years including the 8100, Series/1; System/32, 34, 38; the 3031, 3031AP, 3032, 3033 and Systems Network Architecture. It is my opinion that at minimum, System/ 32, 34 and the 5100 are ephemeral in nature although we may expect some limited upgrading (for example, to a 5200).

System/38, however, seems highly anticipatory of E and H series technology, the former of which offers four processors being readied for introduction bottom (370/115 replacement) to top (370/148 replacement) in the 1979-1980 time frame. The H series will be announced top down by early 1980.

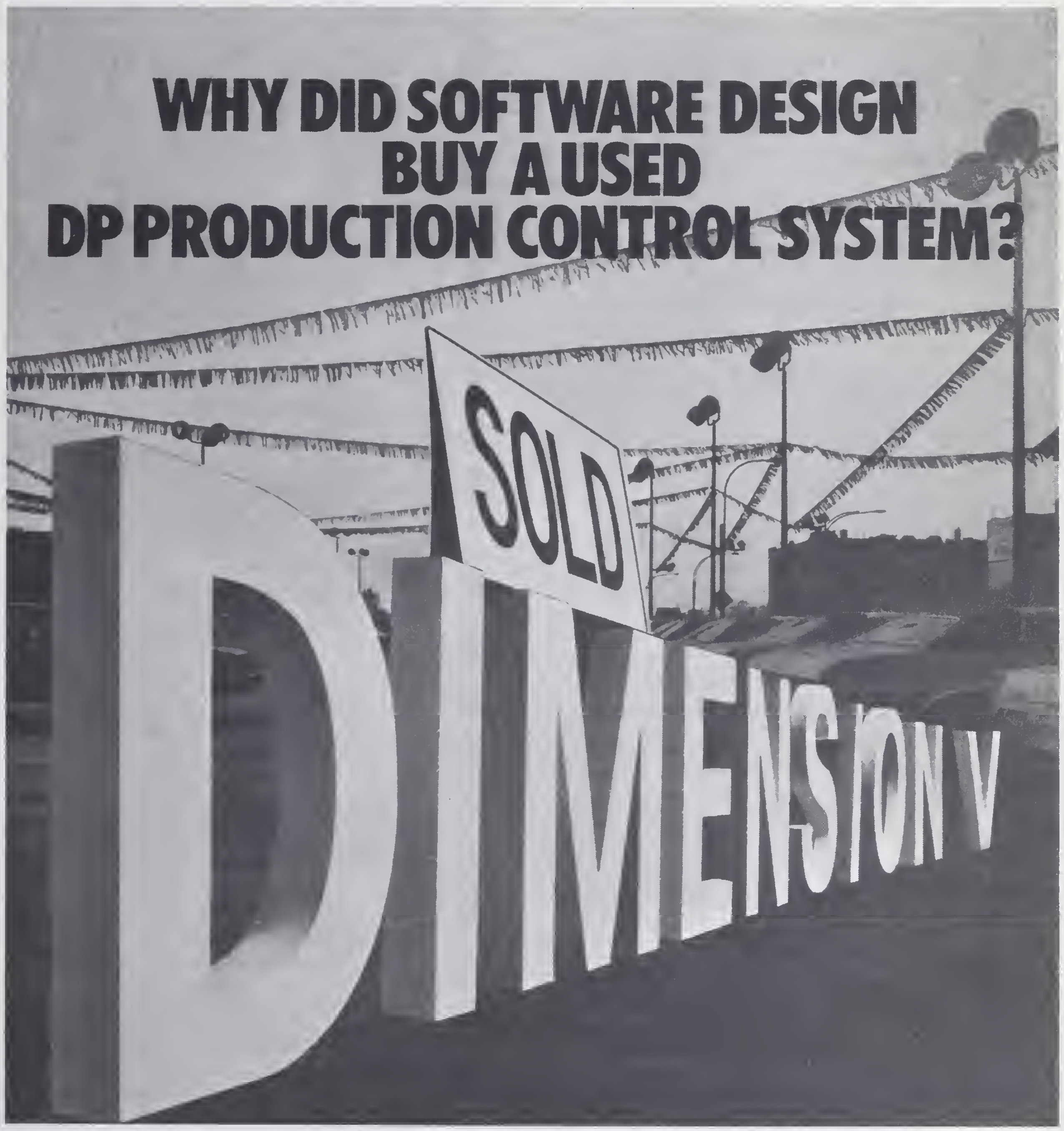
To try to ready products to compete across the board with all IBM's systems announcements in the 1977-1981 time frame is doubtless beyond the resources of all the other computer systems companies individually and severally.

But turning a $14 billion corporation (in 1975) while nurturing it into a $20 billion-plus company in 1978 enroute to a target of $40 billion to $45 billion by 1985 is no small task. With corporate momentum as real and large in magnitude as to be almost without precedent, such a turn could only be accomplished in an atmosphere of uncertainty, albeit limited by the ingenuity of management. It is still difficult to find a reliable textbook containing formulas that define and prescribe the proper mix of, say, speed, fuel, momentum, acceleration and torque for corporations in such a turn.

So, as formidable as IBM's corporate fleet may have appeared in 1975, its management's major decision to alter course was still heroic. The armada entered uncharted space (distributed networks, office automation, unbundled and separately priced selectable software units), carrying along in its wake much of the world's computer industry.

By no means a rudderless ship, the IBM starfleet headquarters has been carefully changing its business emphasis from the manufacture of computer systems and office equipment to the integration of communications, word processing, process control and so forth, and the rendering of increased personnel services.

Although it is too soon to describe exactly the nature of its late 1980s businesses as IBM's management may envision them, I see the emergence of IBM as a superscale "information systems and communications utility" en-



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terprise ultimately depending only on itself for technology (although it may choose to buy some of it as it does today from AMS, Texas Instruments, Inc., and others), and purveying its wares, hard and soft, through a galaxy of products and services.

The would-be competitor in this theater, if blindly following IBM's course, will be spread thinner than silicon on an SOS chip.

Warning to Others

Further to this point, the computer industry's depreciation of sales and lease revenues through price cutting has served to warn any who would compete in a major development that such competition may be short-lived; volume considerations alone would assure this.

And, while holding the competition at bay in this and other ways, IBM ignited a startling stock supernova in December 1978 (i.e., a spectacular 4-for-1 stock split) that served, at minimum, to reconfirm the company's goal of continuing to be one of America's leading blue-ribbon investment opportunities, come what may.

By doing this, it also put pressure on the other major information systems companies to declare dividends when they need the cash. Profit shedding through dividends and encouragement of potential profit-making hopes will be hallmarks of IBM's behavior in 1979.

IBM watchers will note that there are signs that today's IBM is weakening, notwithstanding the gains in the absolute values of the corporation's size and income for the past few years. Evolving products and unfolding marketplaces are heavy contributors to this phenomenon. Economic nationalism and the maturation of other U.S. as well as foreign companies, notably Japanese, are a factor.

With the mainland Chinese and possibly Soviet bloc countries offering marketplaces heretofore unavailable to IBM, one may expect to see a reversal of this weakening, but this will be only temporary. Chinese and Soviet scientists are among the best in the world and their governments quite naturally worry far less about patent infringements than we do — for the time being at least.

Given the lack of trading capital and the compensating abundance of intellectual talent in these eventual marketplaces (not to mention the ease with which the results of U.S. research can be obtained), it seems to me that an overly rosy viewpoint of sales potential in the communist world prevails.

Some would say that corporate strife is serving to inhibit the corporation's progress, but I don't place too much stock in this judgment. No turn is accomplished in our imperfect world without varying degrees of interference.

IBM's star fleet may indeed be on target. Whether it will make it is not, of course, a foregone conclusion; uncharted voyages *are* dangerous. If it does — and there is good reason to believe it will — today's debates on the nature of the world information processing industry at the end of this century will be settled.

Charles P. Lecht is the author of four previous books on computer-related matters: The Programmer's Fortran II and IV, The Programmer's Algol, The Programmer's PL/I *and* The Management of Computer Programming Projects.

He is president of Advanced Computer Techniques Corp., which he founded in 1962, and has lectured widely for such groups as the Association for Computing Machinery, American Management Association, American Society for Information Science and Data Processing Management Association.

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Japan	8,331,000,000	10.0	2
W. Germany	6,527,000,000	7.9	3
United Kingdom	4,794,000,000	5.8	4
France	4,768,000,000	5.8	5
Canada	2,301,000,000	2.8	7
Italy	2,119,000,000	2.6	8
Australasia	2,044,000,000	2.5	9
Brazil	532,000,000	.8	17

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Independents Extend CICS Functions

• *Package Offers More Security*

SANTA MONICA, Calif. — A software package ready for beta testing may provide users of IBM's CICS more protection for their operations than they normally get from the IBM teleprocessing monitor.

Developed by Ambridge International, Inc. (AII), CICS-Protect reportedly supports 32,000 security keys, rather than the 24 keys that IBM allows. The increased number of keys is "more than enough to handle all situations," whereas the IBM level of support was not enough, AII claimed.

Under CICS-Protect, groups of various resources can be defined. This effectively allows certain terminals to be used by certain individuals for certain transactions — and only at certain times of of the day and days of the week, the spokesman explained.

File security is provided on three levels: no access at all, read-only access or full read/-rewrite (update) capability. Beyond that, a log file of all security violations also is maintained, he said.

The violations log helps determine who may be accidentally or intentionally attempting unauthorized access to various systems or sensitive data. If the installation management desires, the terminal at which unauthorized access is being attempted can be placed out of service to prevent further attempts, the spokesman noted.

CICS-Protect adds no significant overhead to unprotected systems, he said. From 10K to 20K of main memory might be required for special tables.

The package is expected to cost $4,500 to $7,500 when it becomes generally available, but installations willing to take it on a beta test basis can have it now for $3,250, AII said.

The company can be reached through P.O. Box 1191, Santa Monica, Calif. 90406.

• *Costs Reported By Transaction*

NEW YORK — Performance information and — essentially as a by-product — financial cost data for centers using IBM's CICS are reportedly available through a software package called CICS-Cost being introduced by Roshell Ivri Software Co.

The program uses the output file created by IBM's performance analyzer program DFHACO as its input. The package calculates the cost of operating the CICS net through the use of "reliable, accurate and

(Continued on Page 46)

• *'Foto/VS' Spools CRT Work*

NEW YORK — The Foto/VS package from H&M Systems Software, Inc. was developed to spool images of CRT screen displays to disk. This enables users working with IBM's CICS to redisplay the screen at a terminal or reproduce it in hard copy without having to reexecute the transactions that led to use of the screen.

Users thus can have a complete audit trail on their work even though a printer was not available and on-line as the original transactions were processed. Conventional CICS operations require such immediately available printer capability when hard copy is wanted, an H&M spokesman noted.

Foto/VS can also serve as a backup to online printing, he said. The software recognizes error conditions on real printers and transfers the images to the spool file, so work may continue.

Referring to the package's support for redisplay of previous images, the spokesman said the software can bring the image up on any terminal "as long as it is the same display class as the one on which the image first appeared."

Foto/VS stores additional information with each image, which allows the user to identify the application and terminal that initiated the image.

In addition, the system allows a master terminal to change dark fields or values on the panel to bright ones. Normally, these fields or values — transferred to the next transaction — can be seen only by modifying the program or by producing a system dump.

The Foto/VS package costs $6,450 or $215/mo from H&M Systems Software, 40 Rector St., New York, N.Y. 10006.

'Metacobol' System Divided Into Free-Standing Modules

PRINCETON, N.J. — Each of the six members of the Metacobol family of products from Applied Data Research, Inc., (ADR) can be used to perform some of the tedious work involved in developing and maintaining Cobol programs in IBM 360/370 or compatible environments.

Cobol/DV, for example, expedites and controls program development and verification, a spokesman said. Programming aids simplify Cobol code generation; test-data generation and source-level debugging support verification, he added.

Cobol/SP supports high-level structured programming and conversion of that code in compilable, ANS Cobol. It includes modular control consistent with top-down design and development techniques and effective control structures for selection and repetition, the spokesman noted.

Cobol/IMS simplifies the interface with IBM's data base management system at the Cobol level. This package provides support for the application programmer and facilities for the data base administrator, according to ADR.

Cobol/QDM provides for quality assurance, documentation and maintenance of Cobol source programs. Formatting, text editing, standardization and optimizing features are provided to analyze, audit and enhance the Cobol logic, the spokesman continued.

A fifth package, Cobol/CP, extends the life of existing programs by supporting conversions between Cobol dialects. Conversion aids are said to include checking of syntax line-by-line, flagging of areas requiring manual intervention, summarizing of critical review requirements and generation of advisory JCL.

(Continued on Page 46)

Geographic File Updated

Addison, Ill. — The geographic data file maintained by List Processing Co. now contains entries for more than 44,000 cities and Zip codes in the U.S., including 1,100 unique Zip codes not published in the National Zip Code Directory.

The file contains optional geographic codes useful for various applications, according to a spokesman. The extra-cost options include Federal Information Processing Standards (Fips), General Services Administration City codes and Standard Metropolitan Statistical Area Codes for more than 270 unique trading areas.

The basic file is available for $890 from List at 937 National Ave., Addison, Ill. 60101.

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IBM Offers Cobol, Other Options for EDX

ATLANTA — IBM's General Systems Division last week announced enhancements to its Event Driven Executive (EDX) operating system for the Series/1 minicomputer introduced in January.

Cobol is now supported under EDX, for example, with a pair of programs. The basic package is a compiler and resident library for developing application programs; the second is a transient library to support the execution of programs.

The Cobol being made available to EDX users is a subset of ANS Cobol 74 specifications. It exceeds the low intermediate level implementation defined by the National Bureau of Standards in Federal Information Processing Standards Publication 21-1, according to an IBM spokesman.

The EDX Cobol is source level compatible with the Cobol introduced earlier for the Real-Time Programming System (RPS) environment on the Series/1, and the RPS implementation was described by IBM as a compatible subset of OS/VS Cobol Compiler and Library — Release 2.

Specifically, EDX Cobol is capable of working with fixed-block, unspanned files created under RPS, through the Exchange Data Format facilities, the spokesman said. The EDX compiler costs $3,700 or $62/mo. while the run-time support costs $300 or $5/mo. Both will be ready in July, he added.

In addition to memory and other systems resources required to support EDX operations, the Cobol compiler needs a 32K-byte partition. The resulting application program requires space as well, but how large the partition must be will obviously vary with the size of the original program, he said.

Terminal Manager, Assembler

Another package, the EDX Multiple Terminal Manager (MTM) may be used to simplify the design and implementation of transaction-oriented applications, the spokesman said. User-written transactions employing predefined CRT screen formats may be used for order entry, inventory file update, inquiry and other types of interactive applications, he added.

MTM will be available in October for $780 or $13/mo, the vendor noted.

IBM has also introduced an EDX Macro Assembler, which processes source statements to produce machine language object modules. The macro support enables the user to reduce the amount of assembly coding, since one macro statement may trigger the assembly of multiple object code instructions.

The Macro Assembler is scheduled for delivery in May, for $840 or $14/mo.

More Software

EDX Indexed Access Method (IAM) software, still another package being introduced now, allows users to build, access and maintain user-defined records in data sets indexed by a predetermined key field. IAM is expected to be ready for distribution in October and to cost $900 or $15/mo.

An EDX Sort/Merge utility — announced for delivery in July — handles records from as many as eight input data sets, sorting and merging them in either ascending or descending order. This package costs $400 or $7/mo, IBM noted.

The basic supervisor and emulator that make up EDX cost $960 or $16/mo, but the spokesman acknowledged users need the utility routines that are packaged separately for an additional $720 or $12/mo.

Other EDX components include a Program Preparation Facility for $900 or $15/mo, the Host Library Support for $80/mo and Macro Library support for $1,740 or $29/mo.

'DCS' Supports 360/370 Sites

SACRAMENTO, Calif. — Geared for IBM DOS and OS environments, Software Module Marketing, Inc.'s Data Center Scheduler (DCS) is a management tool for scheduling, planning, forecasting and documenting computer activities.

DCS will work out an itinerary for jobs passing through the CPU and all other work centers (I/O control, data entry and so on) and also supply operations documentation. The system can schedule multiple processors, users and work centers and provides up to 18 available schedule methods that can be used for the automatic selection of jobs from a schedule file, a spokesman stated.

Eight reports are provided by the system including: the daily job schedule that displays all jobs, steps, work centers and processing times for the schedule period; a daily work center schedule, which includes all related job steps that may be sequenced by due-in or due-out time; output processing labels, containing processing and distribution instructions; and operations documentation.

The software is written in ANS Cobol and the package is provided with source listings, forms and documentation, the spokesman pointed out.

The DCS costs $6,000 for all DOS versions and $8,000 for OS versions. Maintenance and enhancement cost an additional 12% per year, and lease and rental rates also are available from Software Module Marketing, Crocker Bank Building/Penthouse, 1007-7th St., Sacramento, Calif. 95814.

A sensible alternative to buying a computer?

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Ledger Moved to S/3

ANDOVER, Mass. — Adapted to IBM System/3 use, Software International's on-line general ledger system incorporates conversational techniques and has a self-documenting feature that allows both forward and backward paging on multiple data screens, supporting up to 32 terminals.

The software package offers 15 different levels of inquiries against five major general ledger files including actual-vs.-budget, actual-vs.-revised budget, actual-vs.-last year actual and budget-vs.-revised budget. The software also has a continual function-to-function flow that allows the user to move from one application to another without restarting, a spokesman said.

A terminal lock-up function, included in the software, provides security from terminal use by unauthorized personnel.

The package is written in Cobol, utilizing IBM's display format facility for screen design, and absorbs a minimum CCP user area of 26K. The inquiry system, inherent to the software, requires an IBM 3270 or compatible display station with a 1,920-char. screen and a current version of the Cobol compiler.

The inquiry portion of the general ledger system is available now, while a companion data entry portion will be added in August. The price for the combined package is $7,000 from the firm at 2 Elm Sq., Andover, Mass. 01810.

Honeywell Enhances 'NPS' For Distributed Systems

PHOENIX — Honeywell, Inc. has unveiled Release DP1 of its Network Processing Supervisor (NPS) for users of the Series 60, Level 66/Distributed Processing Systems (DPS). The NPS manages the flow of information between a network of remote terminals and/or satellite processors and a Level 66/DPS host under a Gcos environment.

Release DP1 provides all the NPS capabilities, including those introduced with Release NT3 for Series 6000 and Level 66 non-DPS systems. DP1 also provides optional support for High-level Data Link Control (HDLC), the native protocol for Honeywell's Distributed Systems Environment, a spokesman said.

The NPS Release DP1 operates on a Datanet 355, 6600 or 6670 as well as on an integrated network processor, as long as it is connected to a Level 66/DPS Gcos-based system.

The basic release is available on a license basis for $890/mo, while the HDLC option costs an additional $90/mo. Both products are available immediately, the firm noted.

Costs of CICS Shown in Detail

(Continued from Page 41)

flexible" formulae developed on-site, according to a spokesman.

Affected by three parameters, the calculations are unique to the environment and characteristics of the user site. These include the type of CPU and programming language used, the costs of supporting CICS within the total DP budget and the average or exact costs of transmission to the host.

'Good' or 'Bad' Code?

The major CICS-Cost report presents detail and summary information by individual transaction, showing its CPU utilization, file usage, response time, terminal usage, cost of the actual response time and costs of all resources employed, the spokesman said.

The report format enables management to distinguish between "good" and "bad" code at a glance because the program converts the combination of facilities needed by each transaction into Computer Work Units, the spokesman said.

That conversion puts the performance and cost of all transactions on a base.

Either the reports or an output file from CICS-Cost can be used as input to monthly billings, annual budget preparation, short- and long-term planning processes and other analytical operations.

Written in ANS Cobol, CICS-Costs $1,495 from Roshell Ivri at 73 Cornwall Road, Glen Rock, N.J. 07452.

Package Now Set of Modules

(Continued from Page 41)

"CP" also supports conversion of indexed, direct and relative files to Vsam.

Finally, Cobol/MP provides a macro processor through which Metacobol can be extended to cope with special installation-dependent needs.

Developed as extensions of the Metacobol package ADR introduced in 1970 and has enhanced periodically since then, the now-separate packages can be used individually or in conjunction with one another. The permanent license fee for each product in the Metacobol group is approximately $12,000 for OS systems and $9,000 for DOS sites.

A discount of approximately 40% is given when two or more products are licensed together. Monthly and 3- and 5-year leases are also available, ADR noted from Route 206 Center, CN-8, Princeton, N.J. 08540.

DEC, Data General, H-P communications costs are down

If you're supporting remote terminals on your DEC, Data General, or H-P system, with more than one terminal per location, chances are you are paying a fortune in communications costs and probably not even running the terminals as fast as you'd really like to. And to add insult to injury, you have to put up with the occasional phone line 'glitch' which drives your CRT's crazy.

What you really need is a smart little box that will provide error control for your terminals and allow several of them to share one telephone line, contending for the line when they need it, not each paying for a dedicated transmission facility all day.

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For further information, call your local Itel office and ask for a Program Products Representative or contact Itel Corporation, Program Products, 1801 Page Mill Road, Palo Alto, California 94304, (800) 227-8425. Within California (415) 494-3338.

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MIS Bosses Must Push into New Areas: Head

By Robert V. Head
Special to CW

Directors of management information systems (MIS) in both business and government today find themselves grappling with a set of problems unique to their managerial sphere. Unlike their peers in personnel, accounting and marketing, or their superiors in top management, MIS executives are being called upon to direct an expanding variety of system development projects — embodying an increasingly complex mix of hardware and software technologies.

The concept of information resource management, although not entirely new, is engendering increased interest among MIS managers charged with improving cost control and system effectiveness in today's processing environment.

Borrowing concepts and methods from paperwork management as well as from data base management, information resource management approaches information needs throughout the organization in their totality, regardless of the medium on which data is recorded or the equipment and methods by which it is retrieved and displayed.

We have moved light years away from the simple dicotomy of information resources that sufficed in the past — a simple differentation between printed or typewritten documents on the one hand and digitally recorded data on the other. With a growing array of input and display devices distributed throughout the organization, and with the advent of hybrid technologies for micrographics and word processing, managers are being forced to deal with information as an entity almost independent of the recording and handling equipment associated with it.

Federal Paperwork

Of all the boards, commissions, task forces, panels and committees the government has set up in recent years to cope with the information explosion, perhaps the most useful and constructive has been the Commission on Federal Paperwork, which delivered its final report to the President in late 1977.

In its report, the commission proposed adoption of the term "information resource management" to "help breach the conceptual gap between traditional, single-media paperwork handling and modern, multi-media information handling." The commission said that information resource management, "with its emphasis on data management as distinguished from document management, has reached such a state of development as to be in need of both policy and operating level attention.

"Institutionalizing information resource management as a distinct management program at federal, agency and field levels would sharpen and bring together related management activities," it added.

Why this impetus toward concentrating our attention on information resource management? One source of concern lies in the escalating costs of both paperwork and DP. The paperwork commission estimated the cost of federal paperwork as exceeding $43 billion a year, while other sources have estimated federal DP costs at $14 billion a year.

Government is not alone in facing an enormous cost burden to maintain information resources. Industrial firms,

(Continued on Page 54)

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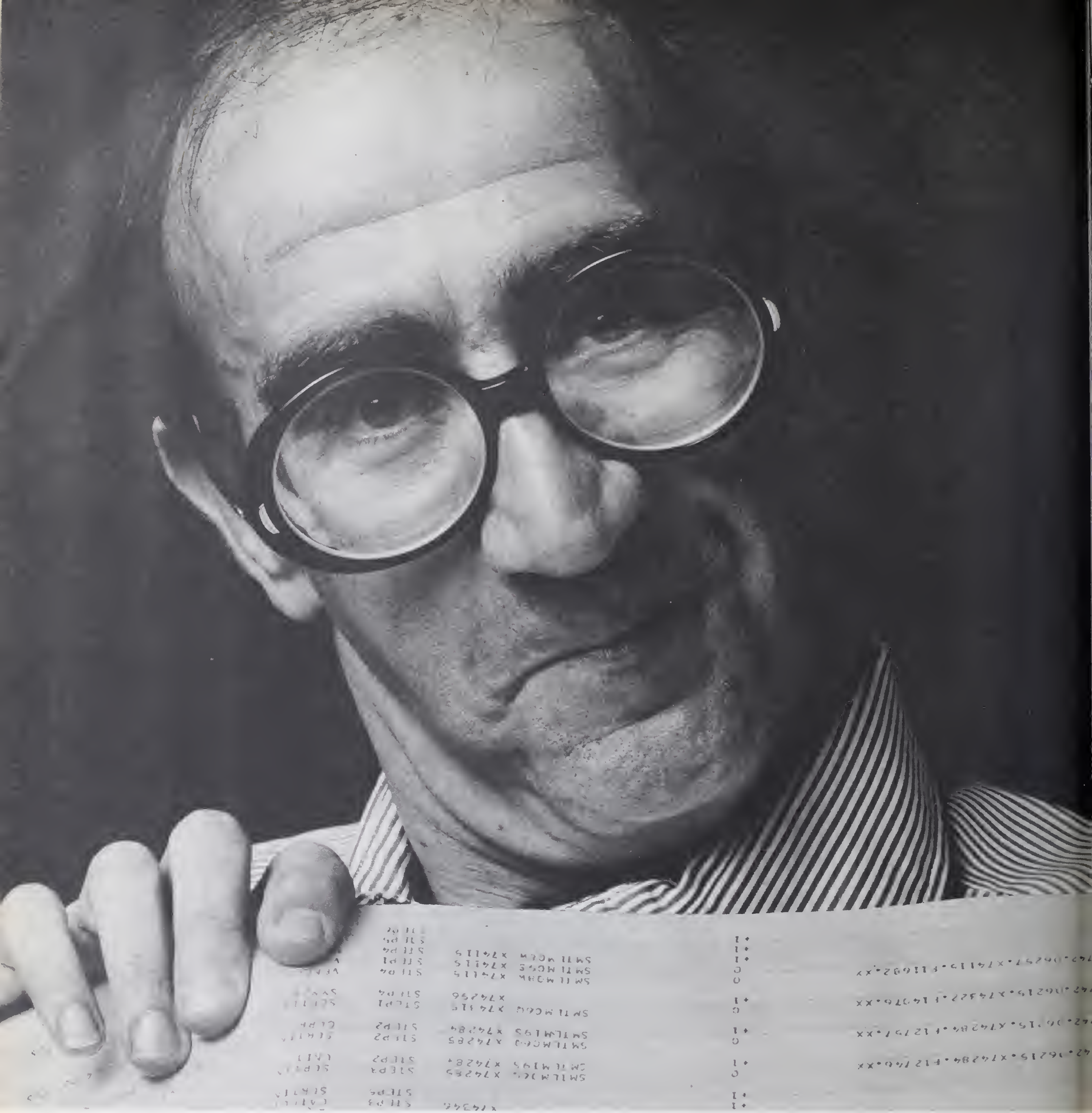

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Terminology Tutorial — Part 2

Code Schemes Vary With Management Goals

By Kenneth Falor
Special to CW

Shared code means that more than one transaction or message may be processed using the same code. In other words, if, when a new transaction comes in, the code to process it is found in memory already, it is used.

Last week Falor outlined the environments in which DP operations take place. Here he explains the internals of task management techniques and code schemes that implement the techniques.

This saves the time it would take to load the program. It is a fairly common occurence in a production transaction processing situation where many terminals are simultaneously working on the same application.

"Shared code" may be shared after a given user (message) is completely finished with it (serially reusable), or it may be shared even if the first user is not finished with it (reentrant).

If a mid-execution stop (and possible load of another program in the same task space) can occur anywhere in a program, the task is said to be completely *reentrant*. If execution can only stop at I/Os or system calls, the task is said to be *quasi-reentrant* (IBM's term, and the way CICS operates). Making a program reentrant may be either left up to the programmers to do manually or can be done automatically by compilers.

If reentrancy must be done manually, special programmer training is often required. The programmer must plan the code for the possibility that, at any unknown time, the operating system may load another program over the first one, reloading and restarting the first program at a later time.

The programmer must not write procedural code that alters itself and must ensure that essential data areas are carefully managed. The latter is generally done by specifying that a certain data area is critical and should somehow be preserved upon any interruption.

Only the most essential data (maybe only a status byte) need be preserved as execution goes along.

'Pure,' 'Impure' Codes

If the compiler is to generate reentrant programs, it usually must assume that any of the data may be critical and so saves all of it. During the compile, it segregates procedure (called "pure" code — since it will and must not change) from data areas (called "impure" code — since it usually changes during execution).

When a program is interrupted, and a different one must be loaded to the same memory slot, only the "impure" code is saved, either in memory or by being put out to disk for later reloading.

The value of compiler-type reentrancy may be marginal for some business programs where the impure code (data) may be significantly greater in size than the pure code. In such a case, the extra-selective swapping and memory management might degrade performance, with little advantage over algorithms that simply swap the whole program.

Reentrancy is a characteristic of a program. Reentrant codes can exist without *multithreading*, but multithreading is needed to take advantage of reentrancy.

Multithreading is the ability of the operating system to stop one program in order to execute (all or a portion of) another. You can multithread nonreentrant code simply by keeping the program in memory, even when another program is being executed, or by saving (swapping out) the entire program.

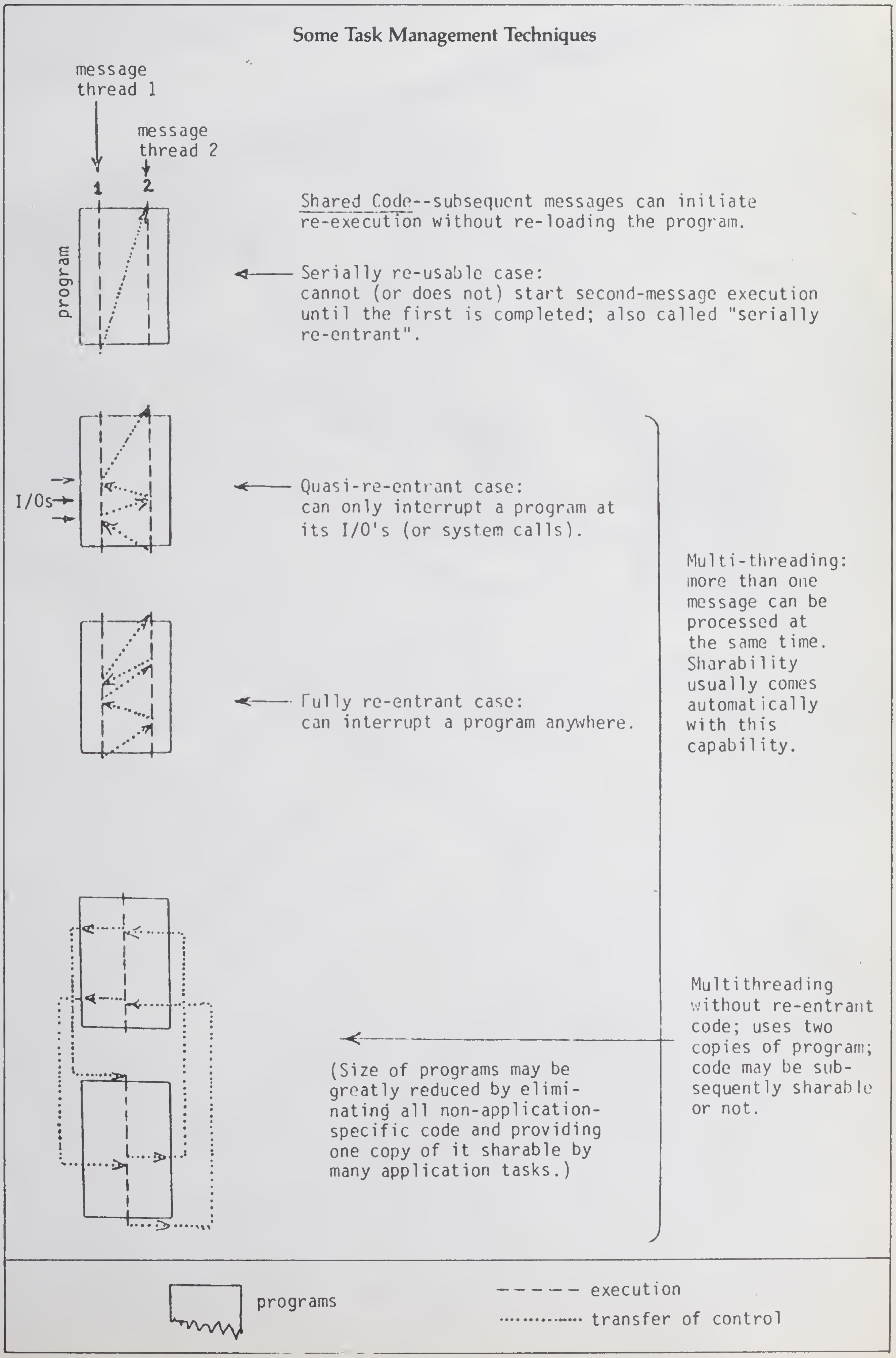
Reentrancy improves memory utilization and still keeps efficiency fairly high since only the data (impure) code must be saved. However, any technique that reduces swap-out (such as load-only methods for transaction processing) may improve performance because of the reduced disk accesses.

Some systems may not load new tasks over unfinished tasks. Every task must go to completion before it is considered for reuse or use of its space.

Fast task management may not be of great concern. For dedicated transaction processing, the CPU task processing will usually be lightly loaded. Any

(Continued on Page 54)

Some Task Management Techniques



Shared Code--subsequent messages can initiate re-execution without re-loading the program.

Serially re-usable case: cannot (or does not) start second-message execution until the first is completed; also called "serially re-entrant".

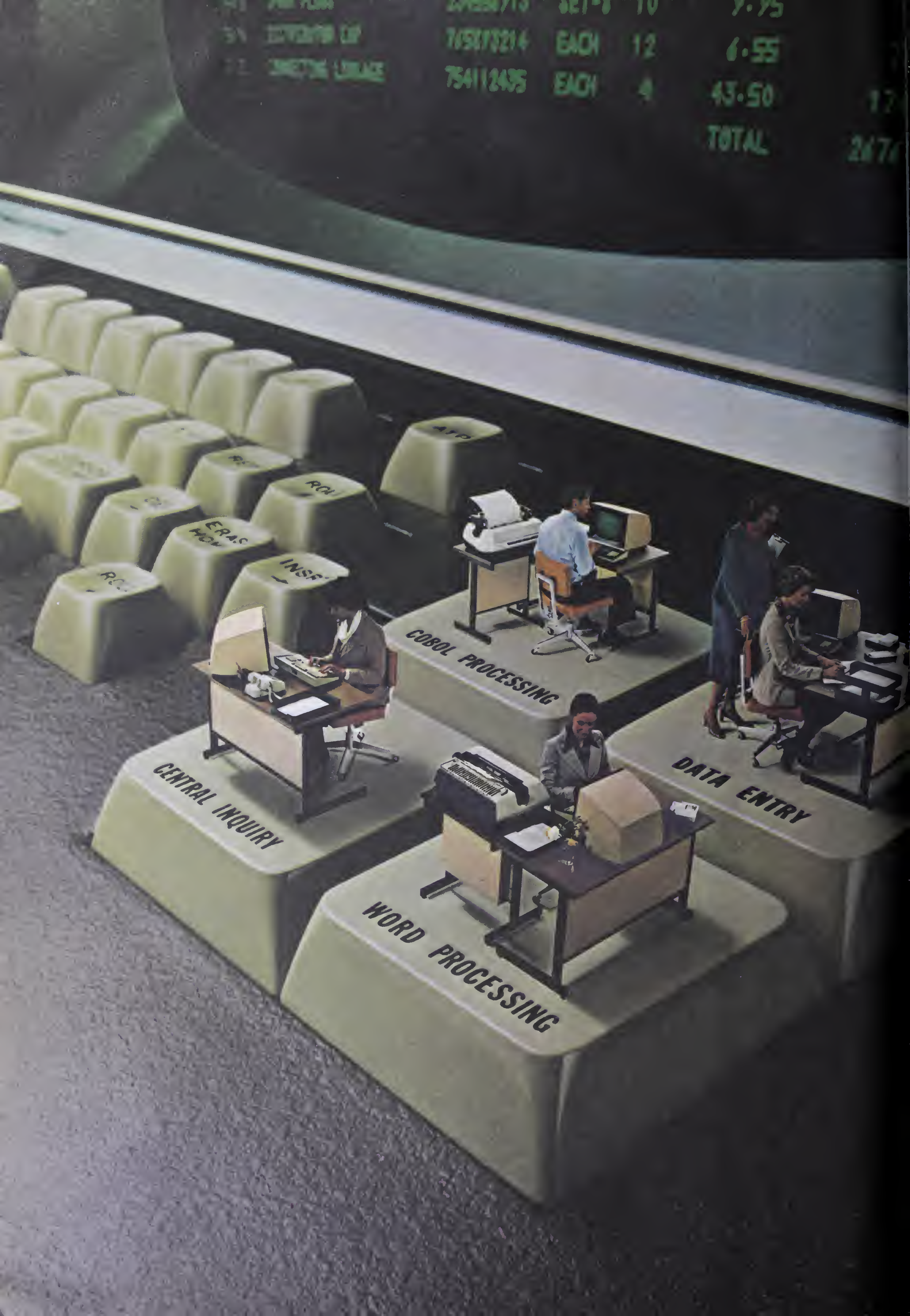
Quasi-re-entrant case: can only interrupt a program at its I/O's (or system calls).

Fully re-entrant case: can interrupt a program anywhere.

Multi-threading: more than one message can be processed at the same time. Sharability usually comes automatically with this capability.

Multithreading without re-entrant code; uses two copies of program; code may be subsequently sharable or not.

(Size of programs may be greatly reduced by eliminating all non-application-specific code and providing one copy of it sharable by many application tasks.)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Aim of Task Management Determines Code Scheme

(Continued from Page 51)

bottlenecks will probably appear elsewhere, perhaps in disk I/O, especially if only one disk is available or if the files are not judiciously distributed over multiple disks.

However, it is usually valuable for some of the system software to be reentrant, especially commonly used utilities such as data management software, multiuser monitors or run-time interpreters or languages; that's usually where it counts most.

Self-Calling Code

Technically, *recursive* code can call itself. This capability is generally only used in the coding of system software. However, it implies multithreaded reentrancy, so the term is sometimes used loosely (but incorrectly) to mean that.

Swapping, reentrancy and multithreading are ways to utilize memory efficiently and economically. It makes little sense to keep a program in memory if it is not executing or about to be executed.

However, this efficiency in memory usage is usually bought for the price of a disk access (load-only with reentrancy) or even two accesses (swapping). Consequently, the expected application environment should be studied to see if these methods will pay off.

If one or two programs are almost constantly executed, it may be better not to swap these and to lock them in memory. To minimize the use of memory in such an environment, it would be wise to see that the locked-in code does not have code within it that is duplicated in locked-in programs elsewhere (such as data management services, any run-time language systems and even compiler subroutines).

For example, the Trax system eliminates such code from individual programs, as well as all screen-handling and restart/recovery logic, leaving the resultant programs quite small.

The terms we have mentioned are often used as sales buzz words. However, we can now begin to see that any one characteristic cannot be "good" by itself.

The goodness will depend on the entire operating environment and the particular combination of task management methods. What may be good for one application or environment may be bad for another.

We hope that this will help set the record straight on the generally accepted technical meanings of these terms. At the same time, we trust that the complexity of the subject also will be apparent.

Falor is with Digital Equipment Corp.'s commercial systems marketing operation.

MIS Manager Must Push Into Unconventional Areas

(Continued from Page 48)

witnessing a rise in the cost of information processing, both in absolute dollar terms and as a sales percentage, are levying increasing demands on the MIS director to control project costs.

The top management of one large company, for example, recently gave its MIS director orders to hold DP costs constant over a five-year period.

Technologists and equipment salespeople delight in pointing out that the unit cost of information processing is decreasing, that the cost of a bit or byte of information stored is only a fraction of what it was a few years ago and that the number of computations per second performed by a minicomputer exceeds that of a giant processor only a generation past.

But these improvements offer little solace to the MIS director confronted wtih an ever swelling chorus of user demands for the acquisition of systems technology.

Forum Organized

These are some of the considerations that led a few of us, under the aegis of the Society for Management Information Systems, to organize a National Forum on Information Resource Management, to be held in Chicago June 25-26. The forum offers a combination of state-of-the-art updates on information resource management by authorities in systems technology, along with presentations by leading-edge user organizations.

A unique feature of the forum is a half-day "outlook panel," featuring directors of MIS from major national companies. They will provide a perspective on future developments in information resource management within their companies and industries.

I believe that the challenge to the MIS director, in his broad, new role as overall information resource manager for the organization, lies in achieving cost control and lean, efficient computer operations, while simultaneously expanding the horizons of the DP staff to embrace new technologies.

If MIS directors do not become concerned with word processing and kindred office automation activities, information resource management will continue to be fragmented between the office "paperwork problem" and "back-room" DP operations. Then user enthusiasm for adapting computer technology to simplify office paperwork processes would grow untrammeled without badly needed managerial discipline.

Head is an assistant for ADP technology with the U.S. Department of Agriculture and a former president of the Society for Management Information Systems.

Oserg Meets Soon

NEW YORK — Amdahl Corp.'s VM Performance Enhancement software will be discussed at a meeting of the OS Eastern Region Group (Oserg) here in New York Friday, April 27. More information is available from Marvin Silverman at Consolidated Edison, 4 Irving Place, New York, N.Y. 10003.

Board Adds Line Support

Interface Ties TTY to X.25 Packet Net

By Ronald A. Frank
CW Staff

BURLINGTON, Mass. — Users with asynchronous teletypewriters (TTY) can now directly connect these terminals to X.25 public packet nets with an interface introduced by Cambridge Telecommunications, Inc. (CTX).

The TTY interface operates on the CTX 9101 Network Interface Processor that serves as a translation device to allow otherwise incompatible terminals to operate on X.25 public packet networks.

The 9101 interfaces the TTYs using CCITT standards X.3, X.28 and X.29. The asynchronous terminals can be supported concurrently with synchronous IBM 3270 CRTs, operating under Binary Synchronous Communications. Both types of terminals can be supported by a single 9101, the company said.

The 9101 is a multiple microprocessor-based communications processor that is now operational on the Telenet X.25 network. It interfaces up to three multidrop 3270 lines through a single high-speed network access link.

Any of these terminal lines can now support either async TTYs or synchronous 3270s. The async terminals are supported at speeds from 50 to 9,600 bit/sec.

Speed Detection

Automatic Speed Detection is available on all async lines. The characteristics of each terminal line are defined by the user during the configuration system generation procedure.

The 9101 typically operates with a 370X front end to an IBM CPU, using CTX software, in the front end.

CTX also introduced an Extended Line Adapter (ELA), which is a circuit board that may be added to a 9101 to provide additional line support. Up to 8 lines are supported on each ELA and up to three ELAs can be added to a 9101. Thus the 9101, with a full complement of ELAs, supports one X.25 access line and from 3 to 27 terminal lines.

The ELA uses the high-speed 9101 bus to communicate with the processor and memory. Each ELA line may be defined to be async (TTY), bisync (BSC, 3270, 3780/2780, Hasp) or synchronous (SDLC or HDLC).

Mixed Configurations

The line configurations may be mixed at any of the supported line speeds up to 9,600 bit/sec. System throughput is said to support line connectivity up to 50 KB.

Leased 3270 lines and long distance dial-up TTY lines can be replaced by 9101 concentration with or without an X.25 network. Using 9101s on an X.25 Public Packet Network reduces connect time charges, port charges, long-distance charges and packet charges, the firm said.

The basic 3-line 9101 costs $7,600. Prices for a 9101 with one ELA (for up to 11 terminal lines) begin at $9,800.

Delivery is 60 days from Cambridge Telecommunications at 5 Old Concord Road, Burlington, Mass. 01803.

Manufacturers See Demand For More 'Smart' Terminals

By Ann Dooley
CW Staff

ST. PAUL, Minn. — The increasing demand for intelligent terminals stems from declining costs in hardware and communications and the growing need among users for these kinds of capabilities, a panel of terminal manufacturers concluded here recently.

IBM put a lot of computer power into user's hands, but didn't create enough terminals for them, a panelist told attendees at Computer Expo 79. By 1980 or 1981, terminals will be available from other companies that are compatible with, for example, the IBM 5051 terminal, but "right now it's only IBM," according to Brooks Hilliard, manager of product marketing for ITT Courier Terminal Systems.

Service is a crucial factor in equipment selection, even though products are being consolidated with integrated parts to simplify service, the panelists agreed.

As much as 85% of the terminal products will be asynchronous instead of plug-compatible in the next decade, according to Hewlett-Packard Co.'s Doug Felsenthal, systems engineer. Companies don't want to make terminals plug-compatible with IBM equipment, he said, because if something goes wrong — whose problem is it?

Mixing and matching vendors creates difficulties concerning maintenance responsibilities, and it is often the user who gets caught in the middle, Felsenthal maintained.

Courier's Hilliard disagreed, contending that this kind of problem has declined. Users won't stand for finger pointing, he said.

Although Courier competes with IBM for customers, once a terminal is installed, Hilliard said he sees IBM as an ally since IBM provided the marketplace. "We work together," he noted. If such fighting did occur regularly between companies, many of the independent terminal manufacturers would be forced out of business, he added.

Service Factors

The panelists instructed attendees to determine what kind of service is provided by a vendor and what kind of service is necessary to their own workloads. Some companies service within hours; others come by the next day. Another factor is how far away the service center is from the site.

Some companies practice preventive maintenance and check equipment on a regular basis, vendors noted, adding that several companies believe they have to compete with IBM in service.

(Continued on Page 56)

Terminal Users Get Port Access With Selector

CHATSWORTH, Calif. — An intelligent port selector for users of multiple minicomputer configurations was introduced recently by Micom Systems, Inc.

The Model 610 Intelligent Port Selector was designed to lower overall communications costs by maximizing computer port and terminal utilization in interactive computer systems.

With the Model 610, terminal users connected directly to the selector or joined via dial-up or dedicated modems can contend automatically for attached ports. The 610 allows the terminal operator to select from his keyboard the "class" of port he would

(Continued on Page 56)

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Spooling Vector Processor Debuts, Helps With Plotting

SANTA CLARA, Calif. — Designed to be used for large, complex plotting applications, Vesatec, Inc.'s recently introduced remote spooling vector processor (RSVP) supports a plot compression algorithm that reportedly reduces data communications' time by as much as four to one over the ordered vector compression technique.

Basically, the system works by compressing data in both "X" and "Y" directions and leaves the vector-to-raster conversion up to the host computer, a spokesman said.

Emulating the standard communications features and functions of IBM's 2780/3780 terminals, RSVP uses a bisynchronous protocol and Edcdic code.It supports dial-up or leased line communications at 2,400 to 9,600 bit/sec and carries its own self-test, line trace and dump capabilities, the spokesman continued.

The RSVP system expands compressed raster format data and accepts vector and print data. A remote magnetic tape spooling capability reportedly simplifies I/O and provides for constant speed electrostatic plotting.

Three tape formats are available: nine-track 800; 1,600; or 800/1,600 bit/in. Two performance options and matching configuration to plotter width and plot complexity also are offered.

Supporting Software

The plotting system is supported by Versatec's Versaplot version 07 software, integrated for IBM 360/370s, which can be installed without modification to the operating system or existing application programs, the spokesman stated.

System components include an intelligent vector processor with 32K bytes of memory and a magnetic tape deck. Printers, plotters, printer/plotters and card readers are offered as additions to the system.

The RSVP system costs $36,000 with delivery in 120 days from Versatec at 2805 Bowers Ave., Santa Clara, Calif. 95051.

Model 610 Port Selector Made for Terminal User

(Continued from Page 55)

like to access, Micom said.

A class may represent all the ports on a particular CPU attached to the 610 in a multiprocessor environment, the vendor said. Alternatively, a class may represent ports supporting a particular application program or terminal type.

If the port is not available, the 610 will advise the terminal operator of the reason, whether BUSY, UNAVAILABLE, UNASSIGNED or UNAUTHORIZED, Micom continued. If ports are busy, the operator may elect to wait in line. He is automatically told how many terminals are ahead of him and receives a GO message when his turn to connect arrives.

Any asynchronous terminal may be connected to a Model 610, Micom stated. The selector's Autobaud feature reportedly provides automatic terminal speed detection at speeds to 4,800 bit/sec.

The 610 is available in a tabletop enclosure for single mini installations and in a floor-standing cabinet for larger installation, supporting several hundred port and terminal connections, Micom noted. The large-scale 610 may be configured with redundant common logic and power supplies to maximize reliability.

Table-top versions cost in the $6,00 to $10,000 range, while the floor-standing models start at $10,000. Delivery is within 60 days of order, Micom added from 9551 Irondale Ave., Chatsworth, Calif. 91311.

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Still More Terminals Predicted

(Continued from Page 55)

Most panelists agreed that a terminal would be less likely to need service than a printer, for instance, which has more moving parts.

But hardware is no longer the pacing item, the panelists agreed, adding that software cost considerations are now in the forefront. "The Texas Instruments of the world are upcoming companies which must provide much more hard logic inside a box — if they want to survive," according to John McPhail, Beehive International, Inc.'s of eastern area sales.

Stand-alone capabilities are becoming "a must" in equipment selection, according to some of the vendors. The panelists instructed users to look for resident operating systems in the product so that all functions can be performed at the terminal. McPhail sees less dependency on the mainframe and more at the remote site.

Terminals in the Future

Somewhere along the line, vendors will have to stop calling the equipment terminals and start calling them computers, HP's Felsenthal said. More little systems are being located at remote sites, or "going distributed," he said.

Users should expect more distributed computer power with dumb terminals hanging on the system, Hilliard stated. It may be more cost-effective to have dumb terminals with multiple distributed mainframes at remote sites, he added.

Tony Paoni, national accounts manager for Pertec Computer Corp., cautioned users to remember that an application is necessary for the existence of the equipment. Hardware is just the tip of the iceberg; software is of main importance, spreading out to unknown distances below the water line, Paoni said.

Responsibilities go hand in hand with more sophisticated equipment and higher costs, Paoni noted. The more complex the system, the more service, software and applications will be needed. If a user doesn't really need a sophisticated system, he should look elsewhere, he told the attendees.

Few radical innovations will be coming from the vendors in the next few years, it seems. Most vendors will follow IBM because it is too difficult to do otherwise, Courier's Hilliard noted.

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Data Communications Course Set

SAN JOSE, Calif. — DP professionals who want to study the field of data communications can attend "Data Communications Systems: A Short Course" to be held here and in five other cities starting May 21-23.

The three-day seminar will be presented by the American Institute for Professional Education, and participants who successfully complete the course will earn 2.1 Continuing Education units, according to the Institute.

The tutorial will provide attendees with an understanding of the technical side of data communications and a knowledge of data communications facilities, including the various types of systems, codes, formats, protocols, performance characteristics, typical applications and design limitations.

When participants finish the course, they should have a working knowledge of the technology and tools used in data communications and should be able to participate in projects, conversing with experts in particular facets of data communications, the Institute said.

About the Teachers

Two data communications professionals will teach the course. Kenneth Sherman has 20 years of experience defining, specifying and designing a number of data communications systems in both military and commercial environments.

Ben McCandless, an independent consultant, has participated in the development, design, implementation and installation of systems for the Department of the Army, Arinc, Delta Airlines and Federal Reserve banks. He recently completed an assignment as project manager for the installation of the communications portion of a New York bank's worldwide distributed processing money transfer system, the Institute said.

The workshop will also be held in Cleveland, St. Louis, Denver, Boston and Seattle, with respective starting dates of May 30, June 6, June 13, June 27 and July 9. Registration costs $495, with discounts available for multiple registrations.

Further information is available from the Institute, located at the Carnegie Building, Hillcrest Road, Madison, N.J. 07940.

Terminal Bows

SALEM, N.H. — MFE Corp. has introduced a microprocessor-based cassette memory storage terminal that is compatible with NCR Corp. variable block length computers and incorporates automatic read after write and parity error check functions to insure data integrity.

The 5450VRL is an 8080-based system that accommodates Ansi and European Computer Manufacturer's Association compatible cassettes and has high-speed skip, search and edit capabilities. In addition, the terminal operates in full- or half-duplex modes, a spokesman noted. The 5450VRL is priced from $2,195. MFE Corp. is at Keewaydin Drive, Salem, N.H. 03079.

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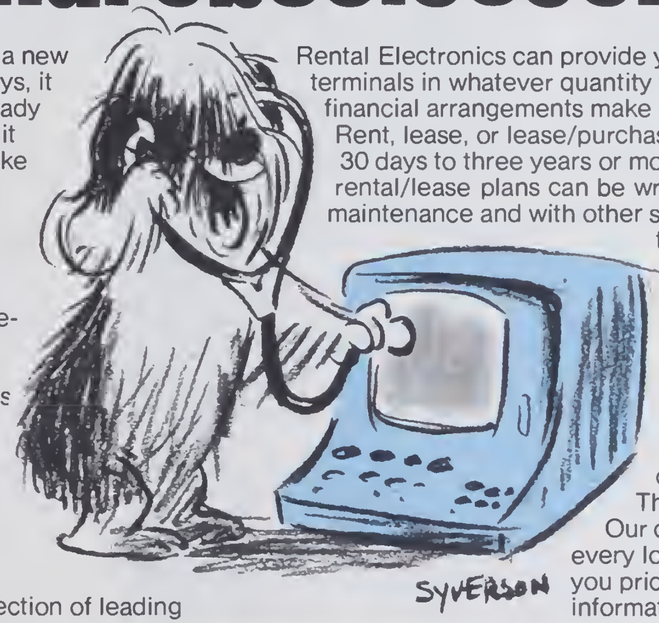

As soon as you take delivery on a new printer or data terminal these days, it seems the next generation is already being announced. Chances are, it has capabilities that begin to make your "new" equipment obsolete. Now, thanks to Rental Electronics, you can have your terminals and highest technology, too.

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If you're interested in more information on renting printers or terminals from Rental Electronics, call one of our local rental centers today. They're listed opposite. Our on-line computers at every location let us give you price and availability information instantly, while you're still on the phone. In the meantime, check some of our featured rental offers below.

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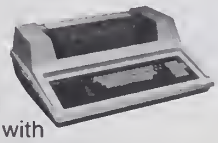
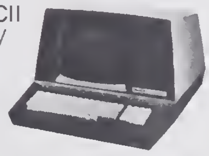


TI Model 820 Keyboard Send-Receive Data Terminal/Printer Printer operates at 150 cps on 9 x 7 wire matrix assembly printhead. Full ASCII Keyboard (ANSI-compatible) with N-key roll over. Operates in Asynchronous, USASCII, RS232C interfaces and is compatible with Bell 103, 113, 202 and 212 units. Selectable baud rates of 110 to 9600.

Hewlett-Packard 2621A/P Terminals Enhanced 9 x 15 dot character cell, full 128-character ASCII character set in 24 80-character lines. Two pages of continuously scrolling memory. RS232C and Bell 103A compatible. 110 to 9600 baud. 2621/P includes built-in printer operating at 120 cps.

Tally T-2000 Hush-Tone Line Printer Acoustically designed enclosure. Operates at 125 (Model 2100) and 200 lines/minute (Model 2200) with standard 64 character USASCII. Line spacing switch selectable, 6 or 8 per inch.

ADDS Regent 200 Terminal 24 lines x 80 characters, 25th "status" line shows operating mode. 128 character ASCII. RS232C/CCIT V.24 communications interface operating 75 to 19.2 BPS, switch selectable. Buffered transmission, auxiliary ports.



Beehive Micro B 1A Terminal 128 ASCII character set; switch selectable scroll/non-scroll mode; X-Y addressing; 24 x 80 display format; single key memory lock; fully buffered communications to auxiliary peripheral device.

Lear Siegler ADM-3A Data Entry Display Terminal 12" diagonal, 24-line screen. 64 ASCII characters. Full or half duplex operating modes, switch selectable, baud rates from 75 to 19,200. RS232C interface, 20mA current loop.

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DAYTON, Ohio — Although fast-food service entrepreneurs employ a great variety of stratagems in their continuing contest for the consumer dollar, the most successful operators have at least two things in common.

First, they exercise tight controls over cash receipts and over every aspect of food preparation, from purchasing and inventory levels to portion sizing. Secondly, they insist upon data collection and processing systems that provide management at all levels with the information necessary for timely and intelligent decision making.

The most cost-effective means for achieving both goals is to use terminal-based systems. Integrated networks of point-of-sale (POS) terminals on the front end record every detail of each transaction.

In the back office, the raw data is input to computers that convert it into meaningful reports. This is done, as needed, on a daily, weekly and monthly basis.

While such information has always been necessary to ensure the maximum return on capital investment, its importance has become even clearer in recent years. For quite some time, largely because of the enthusiastic and worldwide customer acceptance of the services, many fast-food entrepreneurs have been able to prosper almost in spite of themselves.

The industry as a whole, in fact, is growing at twice the rate of other businesses. But profits are no longer increasing at the same pace. The need for automation has never been greater.

Many operators have already invested much time and money to do the job properly. As a result, they have been able to thrive in the face of ever-increasing competition. They maintain and improve profitability despite an inflationary economy that constantly pushes the cost of food, labor and other goods and services to higher and higher levels.

Among the hundreds that could be cited, consider just two cases in point.

Cassano's, Inc., was founded in suburban Dayton in 1953 in a 15-ft by 20-ft pizza shop. Today the firm has 115 company-owned and franchised operations in Ohio, Pennsylvania, Indiana, Illinois, Iowa, Kentucky, Missouri and Florida.

Ponderosa System, Inc., headquartered here in Dayton, is a much younger outfit than Cassano's, but its nearly 400 company-owned stores and more than 200 license operations in 31 states and canada returned more than $13 million in profits last year.

Both restaurant chains use an NCR Corp. 250-6100 fast-food POS system tailored for this particular industry with a programmable memory core of 8K bits. The terminals have preset keys that handle tax, discount and tip calculations as well as change computation and automated reports. The units can accommodate up to 32 different waiter or waitress totals.

Ponderosa does not attribute profit improvment to any single factor because the chain is constantly improving its operations. It is a fact, however, that the fast-food outlet implemented a POS network just before its period of growth.

Tracking Steak and Potatoes

The terminal system counts steaks, fish and shrimp by the piece, chopped sirloin by the patty, prime rib by the ounce and fruit and cream pies by the piece. Freshly baked potatoes are brought out every quarter of an hour, and the POS system also tracks these.

At Cassano's, the POS terminals have keyboards that are custom-tailored to the chain's needs.

"Among other things, this means they provide for 132 menu items [and have] additional keys that tell us just how many orders of specific pizza toppings have been used during a given sales period," MIS director George Ellis commented.

Summarizing the current DP operation at Cassano's, Ellis listed major applications:

- Payroll and personnel: Includes all major payroll functions, plus multicity and state tax capability, wage analysis and special personnel reports.
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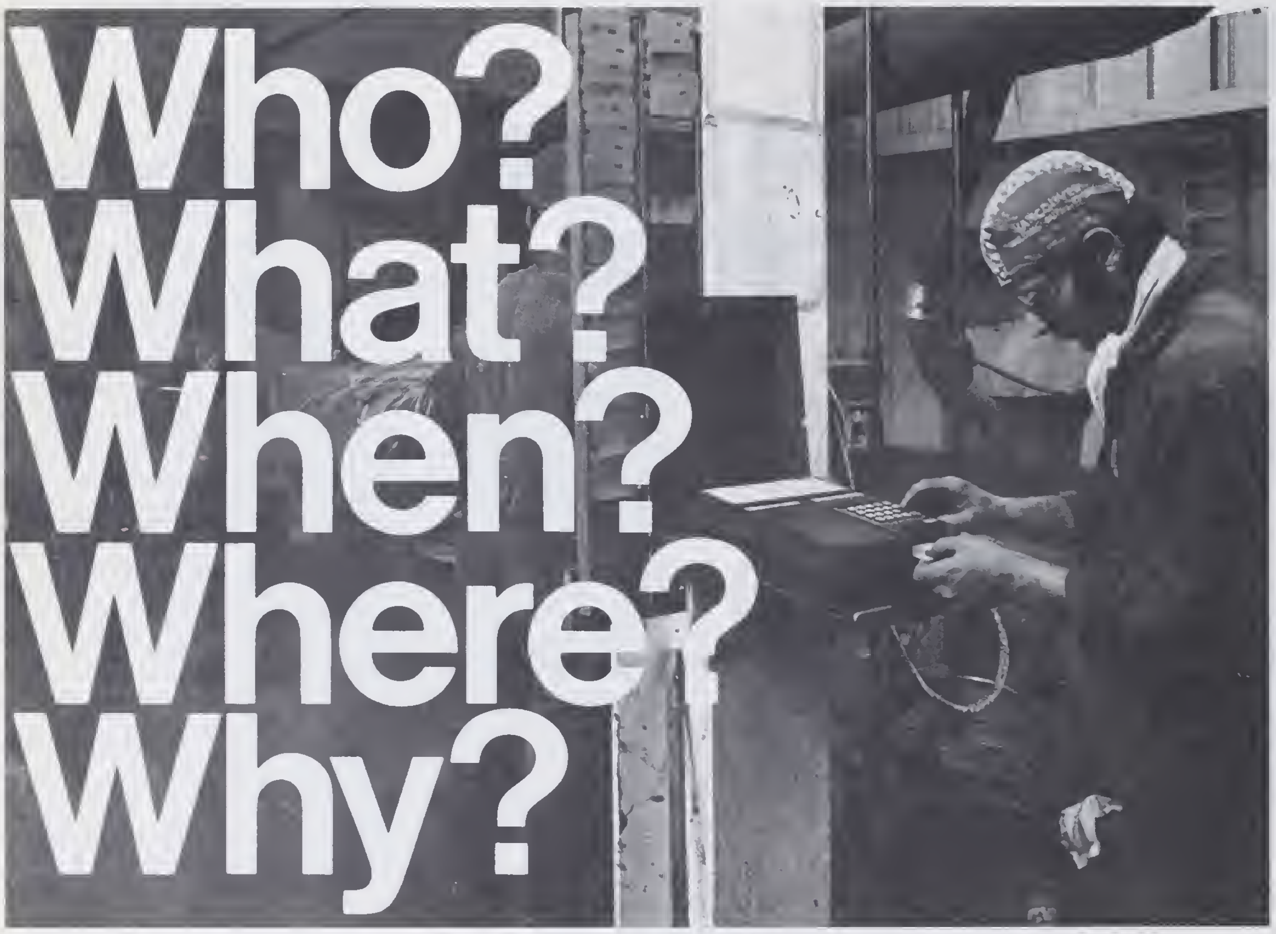
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In addition, you may also select the speedy, economical OMNI 800 model 810 R/O printer. Or choose the versatile 820 KSR, with its new lower price.

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The HP 2621: sim

Simple doesn't have to mean unsophisticated. The proof is in our new CRT terminal, the HP 2621.

Before building it, we took a long, hard look at the way you use a simple terminal. Then we took the knowledge gained in more than 10 years designing computer products and applied it to engineering an interactive character-mode CRT terminal from the user's point of view.

The outcome was actually two models. The HP 2621A, which sells for $1450. And the HP 2621P, which has a built-in printer, costs $2550. You obviously want the sharpest display made. So we used the 9x15 character cell you see on every HP CRT terminal, including the top-of-the-line. And, to help you look back at the data you've entered, we provided two full pages of continuously scrolling memory.

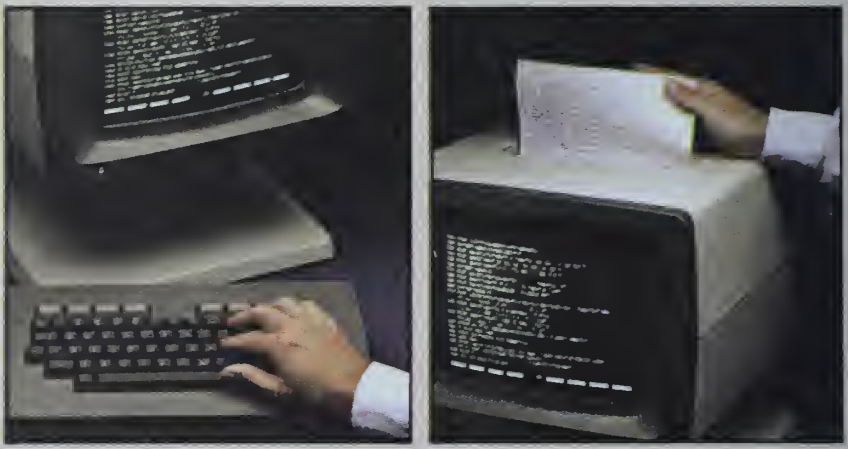
We designed the keyboard like the familiar typewriter, so you don't have to waste time relearning it. We built in eight function keys, too. These control the cursor, rolling and scrolling. And, to make life easier, they're labeled on the screen for self-test, configuration, display and editing.

Editing? On a simple terminal? Certainly. We included character and line insert and delete, clear line and clear display. And, since the 2621 keeps your input separate from your CPU's, you can edit data before sending it to the computer. All without writing a line of system software.

Since flexibility is important in interfacing, we included a user-definable return key that will send your computer whatever code it expects. We also made our terminals compatible with RS232C and Bell 103A, and able to communicate with your CPU at 110 to 9600 baud.

If you need hard copy at your fingertips, take a look at the HP 2621P. With a keystroke, its built-in 120 cps thermal printer will deliver a printout from the screen in seconds.

So why don't you check out the HP 2621 by calling the nearest HP sales office listed in the White Pages. Or send us the coupon. Then see for yourself how sophisticated a simple CRT terminal can be.



Try this on your favorite CRT! With the 2621P, you just hit a key and in seconds you have hard copy of your CRT display. The built-in thermal printer prints upper and lower case at up to 120 cps.

The 2621's bright, high-resolution CRT, with enhanced 9x15 character cell, displays the full 128-character ASCII character set, including upper and lower case, control codes, and character-by-character underline, in 24 80-character lines.

Eight screen-labeled preprogrammed function keys magnify the power of the 2621's keyboard. Preprogrammed functions include editing, terminal configuration, printer control and self-test.

To make numeric data entry faster and easier, we put the 2621's numeric keypad right in the middle of the keyboard. And the 2621's familiar 68-key keyboard is almost as easy to use as a typewriter.

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EASE OF USE
 . 8 screen-labeled control keys
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 . Character mode editing (Modify Mode, Line Mode)
 . Character and line,insert and delete
 . Clear line,display
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42807HPT11

Modular 2,400 Bit/Sec Data Modem Unveiled

ANAHEIM, Calif. — Rockwell International's Electronic Devices Division has introduced a modular 2,400 bit/sec data modem that can be assembled on the systems boards of terminals and other data communications devices.

Based on MOS-LSI design, the synchronous R24 modem consists of three modules: one implements the transmitter, while two control the receiver function. Each module is encased in a plastic package with vertical pins, permitting them to be plugged into standard connectors or wave soldered on a printed circuit board, a spokesman stated.

The transmitter, R1 and R2 receivers are compatible with Bell 201 B/C and CCITT V.26 A/B standards.The transmitting portion is based on a differential phase modulation design, and the receiver utilizes coherent phase detection techniques. The R24 uses differential four-phase modulation at 2,400 bit/sec with a fall back to differential two-phase modulation at 1,200 bit/sec.

The unit also can operate on a two-wire, private-line half-duplex mode or on a four-wire line, full-duplex mode. With minimal interface circuitry, the R24 modem can be configured for operation on dedicated lines or over the general switched network, the spokesman said.

Offering a TTL/Cmos-compatible digital interface, the unit contains a scrambler/-descrambler compatible with CCITT V.27 that can function as a 127-bit test generator for diagnostic loopbacks. In addition, a fixed compromise equalizer for unconditioned 3002-type lines is positioned for operation in the receiver portion. This equalizer may be repositioned for transmitter operation or completely removed with external switches or jumpers, the spokesman pointed out.

Designed to work with the R24 unit, an optional modem evaluation board (MEB) is equipped with interfacing circuitry and facilitates performance checking and system design.

The R24 modem, including the three modules, costs $550; the optional modem evaluation board costs $50. Rockwell International is at 3310 Miralome Ave., Anaheim, Calif. 92803.

Data Service Bows at NCC

DELRAN, N.J. — Datapro Research Corp. will unveil a monthly updated loose-leaf information service at NCC this June in New York that was designed to help DP and communications management implement improved communications systems.

Datapro Communications Solutions reportedly will contain hundreds of problem solution reports on the latest communications systems, methods and equipment, a spokesman stated. The service will consist of two loose-leaf volumes, monthly supplements, an industry-specific newsletter and use of the firm's telephone inquiry service.

Wide Range of Topics

Topics covered in the report will include: basic concepts, systems components, planning, system design, selection and acquisition, installation and management, operations management, future systems, vendors and communications standards, procedures and protocol, the spokesman continued.

NCC '79 attendees will be able to subscribe to the service for $280, a 15% reduction from the regular $330 subscription rate.

Additional information on the communications service and other Datapro reports and publications is available from the company at 1805 Underwood Blvd., Delran, N.J. 08075.

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With the acquisition of Quantor Corporation, NCR steps forward as a leader in the Computer Output Microfiche industry.

Quantor's proven technological leadership and marketing organization complement NCR's total systems capabilities. The combination provides a major new element in the micrographics industry.

Quantor has been responsible for significant technological advances. These include the industry's first self-contained unit that provides finished, ready-to-use microfiche in a single operation. Also the first fully integrated and minicomputer-controlled COM system.

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For information on micrographics products and service, write to NCR Corporation, Micrographics Systems Division, 520 Logue Avenue, Mountain View, California 94043.

NCR
Complete Computer Systems

Z80-Based Terminal Displays Up to 40 Lines of 80 Char.

ANN ARBOR, Mich.— Designed to display large amounts of data at one time, Ann Arbor Terminals, Inc.'s Z80-based terminal displays 40 lines of 80 char. and includes a 15-in. CRT screen.

The Model 4080-Compat is software-compatible with the firm's transistor-transistor logic-based K4080D terminal and features upper- and lower-case characters formed in a 7 x 7 dot matrix in a 10 x 10 dot field. Three character accents — blink, dim and reverse-video — are included for highlighting purposes, and the unit's cursor is displayed as a blinking field, a spokesman explained.

The terminal has a 72-key detachable keyboard that generates the full 128-char. Ascii set and includes a separate numeric pad and cursor control keys the spokesman said.

Commands on the keyboard include: cursor home, return, up, down, right and left, set cursor position and set character accent.

The terminal's data speeds are selectable from 110 to 9,600 bit/sec; the unit can operate in a local, full- or half-duplex mode; the keyboard functions in either a teletypewriter or full-Ascii fashion; and the CRT display can page or roll.

Single quantity prices for the 4080-Compat begin at $1,595 with delivery in eight weeks from the firm at 6107 Jackson Road, Ann Arbor, Mich. 48103.

Statistical Net Processor Functions as Concentrator

PALO ALTO, Calif. — Boasting microprocessor-control and two-, four- or eight-channel operation, Prentice Corp.'s statistical network processor (SNP) can function as an intelligent concentrator and a statistical time division multiplexer.

The SNP-1000 features a multipoint option that reportedly allows the user to poll a number of remote sites along a transmission line. This permits the network designer to optimize telephone line savings in applications where a conventional concentrator, frequency division multiplexer or time division multiplexer cannot be fully effective, a spokesman claimed.

The Prentice SNP-1000

The unit's multichannel configuration concentrates asynchronous inputs into a single high-speed output for maximum operating efficiency. It can be equipped with an additional command and a diagnostics port that provides the capability of monitoring all important system functions and of altering most system operating parameters from a single, centrally located console.

Error-Checking Routines

A number of error-checking routines come with the device along with a down-line loading function that permits changes in remote site operation to be made from a central location and continuous self-testing, the spokesman said.

The SNP-1000 is completely transparent to terminals, CPUs and software and can be installed with no changes to a user's existing system.

The four-channel model costs $1,500 with delivery in 60 days from Prentice Corp. at 795 San Antonio Road, Palo Alto, Calif. 94303.

NCR Unveils Teller Terminal

DAYTON, Ohio — NCR Corp. has announced a microprocessor-based teller terminal for financial institutions that reportedly can be programmed to meet each bank's individual operating characteristics.

The NCR 2261 supplements current NCR financial terminals. While it was designed primarily to be linked with a central computer at a remote site, it has the intelligence to function as a free-standing system, the company claimed.

The basic 2261 is an integrated terminal and includes the electronics, a CRT display, an alphanumeric keyboard and a 40-column printer. It can be programmed using either the keyboard or programs loaded via digital or audio tape units. Programs also may be loaded in the central CPU and transmitted to remote terminals.

Available Options

Options include a tape cassette unit, a magnetic stripe reader, a remote personal identification number and a cassette adapter.

Communications methods used with the terminal conform to NCR's Distributed Network Architecture. Communication in asynchronous mode also is possible, NCR said.

The terminal has a base price of $3,650, with monthly rental starting at $152.

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COMPUTERWORLD

Special Report

Beefing Up Data Entry

Edited by Tim Scannell
April 23, 1979

Coming 'Out of the Basement'

Data Entry Changing, Needs Separate Identity

By E.F. Feist
Special to CW

Data entry has been considered part of data processing for a long time.

But in the past decade, there have been dramatic changes in data entry, and a part of that change has been a more sophisticated supervisor/manager in charge of this function.

This new breed has not been content to stay in the docile role so long associated with keypunching. They want to come "out of the basement" and to be treated with respect as professionals.

This will not be an easy objective to meet, since not many outsiders really understand what a data entry supervisor does all day. There are even fewer people who want to know.

And then there are all those people who, for years, have been predicting the end of keypunching. Meanwhile, the cost of feeding the computer has gone higher and higher.

Data entry is taking a larger share of the DP budget, but perhaps it is time to reconsider whether data entry is really part of DP.

The following quotation is from an introductory DP text: "A keypunch operator's job is probably the least skilled and one of the less desirable jobs in a computer installation. Many systems, of course, do not utilize the punched card and so this category may not be included in their computer operations."

Since the punched cards and keypunch are no longer a part of DP, where did all the keyers go?

They become data entry operators. The title changed but the people are still there and still use their fingers to feed the computer a steady diet.

Similar Change in DP

The DP field has also gone through a change in names. It wasn't long ago that the designation was EAM (Electric Accounting Machines).

Like the name change for data entry, there were considerable differences implied in going from EAM to DP. There were those who didn't adapt to the significance of the new designation and slowly faded away from the scene.

The change from keypunch to data entry was also the result of technical progress. Unlike DP, however, the basic resource in both data entry situations is still people. The DP field has always required a high degree of technical orientation; the wonders of technology are still relatively new to the data entry world.

However, the technical advances in data entry have attracted the attention of DP people. The trade press has an endless supply of stories of how this or that new system saved companies thousands of dollars. A fair share of the advertising also touts the latest technical advances available to solve the "input-bound" problem.

How many articles deal with the problems and opportunities confronting the data entry supervisor? How many advertisements in the classified section seek out professionals in the data entry field?

An editor of one of these periodicals once responded to a question on data entry by calling it "a boring mundane field which no one really cares about." Another editor was only interested in articles concerning something like "how XYZ company successfully uses operators with some type of handicap."

Technical Issues

But serious technical issues remain to be addressed. There are all types of systems and vendors for both traditional data entry and distributed systems. However, there is no dominant IBM-type vendor to set standards so everyone does his own thing. Users find a minimum of compatibility in going from one data entry system to another.

This is true for operators as well as the people who have to make a system run. It also makes it difficult for supervisors and managers using different types of systems to communicate on a technical level.

In addition, there are few opportunities to really learn to use the new systems efficiently. Documentation from the vendors is mainly of the reference variety and suitable for training purposes. Schools, beyond the operator level, are nonexistent, as are programming instruction books and the like.

For all practical purposes, data entry is still an apprentice type of profession, much like DP was in the early days.

The vendors, naturally, sell to the decision-makers. Since this has usually meant a DP type, the resulting equipment and sales pitch reflect a technical

(Continued on SR/8)

Words to the Wise

By Patricia Garcia
Special to CW

MORRISTOWN, N.J. — Data in, data out is a serious subject. Here is a bit of advice from an ex-data entry/release supervisor:

Rule 1. Garbage in most assuredly equals garbage out.

Rule 2. Assumptions during planning often lead to failure.

Rule 3. Lack of provision for security/privacy can also pave the way for disaster.

Rule 4. Planning discussions between a non-DP user and a technically-oriented DPer result in garbage in, garbage out. Someone who speaks the language of both can avoid confusion.

Rule 5. Time frames are important planning considerations and should allow room for human errors such as system/programming problems; reconsideration of data needs; and lost tapes, and cards.

Rule 6. Costs should not be a last-minute mystery.

Rule 7. DPers should continually analyze user needs, while users should analyze only the output they fully understand.

Rule 8. Software can be flexible and so can the users.

Rule 9. A user's fear of computers equals lots of paper output, and a DPer's fear of users results in inflexible guidelines.

Rule 10. The DPer's respect for the user's knowledge plus the user's respect for the DPer's knowledge equals useful output.

Garcia is now an assistant marketing manager for AT&T.

Helping Satisfy New Demands

Group Aids Data Entry Professionals

Special to CW

The Data Entry Management Association (Dema) was formed for professionals commonly considered the black sheep of the computer community, according to Dema president Norman Bodek.

But there are a lot of black sheep, because in less than three years, the association's membership has jumped from a few dozen to more than 800, with the first regional chapter recently started in Cleveland.

However, one of Dema's major goals — to erase the stigma surrounding data entry personnel — is only beginning to be realized.

"Before Dema, there was a void in the computer world," Bodek said. "Data entry was considered a necessary evil in the DP community's mind. Data entry personnel were looked upon as a mass of people, manning keypunch machines that put holes in cards. They worked, they produced, but they shared none of the glory."

Besides increasing the prestige of the data entry field, another Dema goal is to promote the professional growth of its members, who represent large firms like Exxon, J.C. Penney and Aetna Life Insurance Co. as well as government agencies, educational institutions, small companies and service bureaus. Members hail from all sections of the U.S., Canada and abroad.

Changing times created a need for Dema, the organization's president explained. With the advent of new equipment and technology, the full responsibility of data capture came to rest with the data entry department.

New demands were made upon managers. They had to be true professionals.

"Today, they must know how to program, how to handle the full correction cycle, how to motivate people, how to schedule and budget. They must be real managers — no different from the manager of a computer facility," Bodek continued.

No professional association existed to

(Continued on SR/5)

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Cashiers Get 'In the Swim' With Slot Scanners

Special to CW

NORFOLK, Va. — Cashiers at Farm Fresh Supermarkets use both hands to pull items past their bar code slot scanners. Training Director Rickey Ives, who devised the technique, calls it "swim" scanning because the cashiers look like they're doing a crawl stroke.

The payoff is improved productivity — from an average of 27 items a minute using electronic sales terminals to 43 now. That jump of nearly 60% means less waiting for customers and lower labor costs for Farm Fresh.

"Payroll savings. That's what I'm looking at because that means we can hold down the margins on food even in the face of increased costs," Eugene Walters, president of the 16-store chain, said.

Eugene Walters, president of Farm Fresh Supermarkets, greets customers at one of the slot-scanning checkout lanes of the company's newest Virginia Beach store.

Farm Fresh, headquartered here, uses NCR Corp.'s Model 2552 modular supermarket scanning system — comprised of a series of NCR minicomputer-based terminals linked to the firm's 40K-byte processor — to keep track of the foodstuff flow at the checkout counters.

Walters underscored the importance of slot scanning by noting that front-end costs are, next to refrigeration, the most costly aspect of supermarket operations.

Additional labor savings with scanning comes from eliminating item price marking, Walters said. He estimated that price removal reduces the outlay for stocking a store by 15% to 20%.

And he cited the benefits of being able to track specific merchandise categories.

"We did a case history of health and beauty aids," he related. "As a result of eliminating incorrect and illegible prices, we were able to raise the department's profitability by 4% to 5%.

"Supermarket people are usually good with food, but they are not generally trained to think about the marketing of non-food items which Farm Fresh, and most other markets, are carrying in increased amounts.

"The nonfood items are more profitable, and you can have low food prices by doing a good job over there [in nonfood]," he explained.

For consumers, Walters said, in addition to lower prices and less time spent in checkout lanes, slot scanning means more accurate sales receipts with detailed, alphanumeric descriptions of everything they buy.

As for the cost of the technology, the Farm Fresh president estimated that the investment of approximately $12,000 per checkout lane can be recouped in less than two years.

"You've got to have registers anyway," he said, "so you're only looking at the added outlay for scanning, versus the benefits it can deliver.

"The payoff can actually take less than a year, because volume has so much to do with it."

Walters noted that on a volume of $10 million annually, every one-tenth of a cent improvement in profitability translates into an increase of $10,000.

Headed for 'New Age'

"I feel we're headed for a new age in retailing," he continued. "Grocers went from the Depression to the Golden '60s, when they couldn't make a wrong move.

"But now the emphasis must be upon efficiency, and that takes better management information. It's time to accept scanning as the right tool.

"In five to 10 years, the old cash register will be as out of date, as antique as the cigar box for cash is today. And customers will know it . They'll recognize that the new equipment means lower prices," Walters predicted.

With respect to the last point, grocers will have a job to do, he said, noting that Farm Fresh, which installed its first scanning system in late 1977, held back for nearly a year because of a lack of consumer knowledge — and acceptance — of the potential benefits.

"That's one of the real problems of the food industry — consumer education," according to Walters, who is board chairman of the National Association of Retail Grocers in the U.S.

"We haven't realized how intelligent the consumer is. You have to tell them what you're doing, make them a part of your business," he said.

Introduction to Scanning

Farm Fresh set out to do that with scanning. Every spring, the Sales & Marketing Executives of Tidewater, of which Walters is a past president, holds a trade show for the public.

In 1977, months before it instituted scanning in its first store, Farm Fresh used the trade show as a forum to introduce the concept, using equipment borrowed from NCR for its display booth. The system featured was the 2552.

The total setup consisted of a laser-beam scanner, electronic keyboard that provides price lookup for such items as produce, sales receipt printer, check validator and automatic change dispenser.

At the Farm Fresh trade show booth, company personnel demonstrated how slot scanning works and handed out informational literature.

To continue its consumer education program, Farm Fresh distributes a brochure in its stores today, along with promotional literature and the application for a check-cashing card.

Phasing Out

As another aid to customers, when Farm Fresh made the first scanning conversion in the Tidewater area, it retained item pricing for a time. It was eliminated, aisle by aisle, over a period of two months or so, and the shelf price stickers were augmented with even larger tags calling attention to special bargains.

"We wanted time to iron out any bugs that might develop and to build customer confidence in the computerized pricing system," Walters said.

Overall, the educational effort was remarkably successful. "We ran 25,000 people through that first store in the first week," the Farm Fresh president said, "and fewer than 25 even commented on the slot scanning. I just don't hear anything bad at all."

Susan Mayo, director of consumer affairs for Farm Fresh, concurred in Walters' assessment of the public's acceptance of scanning. Although her job virtually entails soliciting customer complaints, she reported that she simply hadn't had any about scanning.

Drawing upon his experience, Walters set forth these priorities for embarking upon scanning:

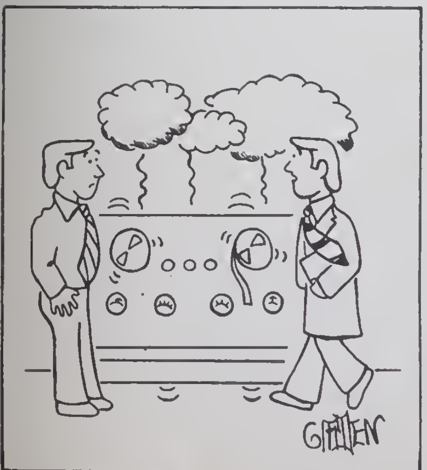
- Don't try to do everything at once. First and foremost, get your customers satisfied with your stores and the merchandise you're offering. That means good decor, cleanliness and all of the other things associated with any successful retail operation.

- Before beginning scanning, concentrate on getting the price file right. For the initial Farm Fresh outlet, that job required four weeks to make sure the 17,000 items on the magnetic disk files of the NCR processor were priced and identified correctly.

- Take time to train people correctly. At Farm Fresh, even when cashiers are familiar with the NCR 255 electronic terminals which the chain formerly used, they get an additional hour of training with the 2552.

- Assign a team to do the actual installation and give its members total responsibility and authority. "When they have everything ready, then they can turn the system over to the store manager and the head cashier," Walters stressed.

- Don't burden store personnel with any of the details of installation. Have a meeting in the beginning and lay down the ground rules. Don't send a letter or a memo. Meet with people in person.



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For Connecticut Commission

Data Entry 'Recipe' Lowers Heat on Operator

By Donald J. Maloney
And John V. Conkling
Special to CW

WETHERSFIELD, Conn. — In a medium-to-large-sized room, mix about 14 people, desks and terminals — being careful not to overbeat — and blend the ingredients with love and care. In another room, add a CPU, disk drives, printers and other equipment, folding slowly to ensure proper air space in the mixture.

Position the rooms close together in a warm (not hot to touch) atmosphere, and when the ingredients blend smoothly, you have succeeded in creating a palatable data entry banquet.

Although this DP recipe may not suit the tastes of every data entry equipment user, it works quite well for the State of Connecticut's Commission on Special Revenue. With a menu consisting of a Nixdorf/Entrex 600/50 processor, a 33M-byte disk drive, one printer, one tape drive, 14 Entrex Corp. terminals and a communications controller, the commission manages to stay ahead of the daily flow of administrative paperwork.

An ideal data entry system allows the fastest possible transfer of information from code sheets to machine, and optical scanners fill this bill. However, adopting such a system can force operator layoffs.

We believe we have an excellent staff and would hate to lose any of them to an optical scanning system. Besides, we are not ready to turn to optical scanners because of the possible reject rate of hand-coded forms, the costs of the machinery involved and the need to constantly update read formats to interrogate new forms.

On the other hand, we have tried various suggestions and both used and discarded some in an attempt to ease the load on our data entry personnel. One suggestion we implemented was to put all of the data pertinent to the form on the form itself, but outline with boxes the data to be keyed. This eliminates questions as to what is to be keyed or ignored and helps the operator locate the figures or statements more easily.

Aligning as much of the data as possible in a right-to-left readable format to eliminate jumping around on the form and combining a number of forms on a single page — to cut down on the time spent turning pages — also helps ease the operator's workload.

Doing away with unnecessary keystrokes (why key "500" for $5.00 when "5" will do on a field that is always whole dollars) and eliminating unnecessary details — such as a state designation on instate material — is also both time and work saving. After all, eliminating two characters or a dollar sign may not seem like much but if 40,000 forms are involved, it could save 10 hours or more of keypunch time.

A thorough analysis of all source documents should be done before attempting to make any work flow improvements. Following are some points to consider:

- Does the source document provide all of the necessary information needed to produce the final report?
- At what point in the normal document flow does the document contain all necessary information, signatures and so on? At this point, the document should be routed to the data entry department.
- Is the source document designed for ease of data entry?
- Is there sufficient space provided on the source document to record information legibly?
- And finally, is it necessary to transcribe source document information onto a data entry form? If so, this is a duplication of effort, involves much time and leads to all types of errors.

If this initial analysis is done properly and all necessary revisions are made, it will undoubtedly facilitate data entry. The cost of the analysis and the time spent redesigning source documents will be more than offset by the eventual increased efficiency and accuracy.

Cooperation, inventiveness and a spirit of adventure can combine to increase interest as well as efficiency. In addition, programmers, analysts and management must listen to all suggestions from personnel.

Maloney is chief of DP and Conkling is assistant chief of DP at the Connecticut Commission on Special Revenue.

Group Backs Professionals

(Continued from SR/2)

help this new breed of data entry manager, so Dema stepped in to fill the need.

Three years ago, while he was chairman of a seminar on data entry at a New York conference sponsored by the American Management Association, Bodek encountered a group of people who shared his concern about the developing trends in the field and the lack of available services. At that time, he was president of a Greenwich, Conn., offshore data entry service bureau that employed about 150 operators.

"As a result of this seminar and after I talked with others in the same area, Dema was formed," he recalled.

In a brief time, the association's membership and services have grown considerably.

Four regional meetings are held around the country each year. They offer a day and a half of lectures by data entry experts and workshops to review the latest developments, new equipment, applications and motivation programs.

In addition, three seminars are conducted in managerial techniques, information system concepts and distributed data entry.

Annual Conference

Each year, the annual Dema conference draws hundreds of professionals from around the world. This year, the Third Annual Data Entry Management Conference will be held Sept. 25-28 at the Hyatt Regency in New Orleans.

IBM and equipment vendors like Inforex, Inc., Nixdorf Computer Corp. and Consolidated Computer, Inc. will display their latest key-to-disk equipment. Interstate Electronics will show its most recent developments in voice data entry. Keytronic Corp. and Cummins-Allison Corp. will display their newest optical character recognition equipment.

Another session, "Meet the Expert," will feature vendors and experts who will answer inquiries and provide professional counseling in different areas of data entry.

Dema also publishes a monthly newsletter with up-to-date articles about trends in data entry, effective managerial techniques and different approaches members have found effective in solving their departments' problems.

The association prints an annual survey to evaluate current equipment used by members.The forms are available upon request, and results are published each year in the newsletter.

The group also maintains a file of equipment users so members can contact them about performance.

There is also a Dema hotline to assist managers with problems.

"Dema is trying to create more effective managers," Bodek pointed out. "It is trying to help them produce greater profits and solve difficulties with people and equipment. It recognizes their needs as true professionals."

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OUR TERMINALS HAVE IT ALL TOGETHER

Hospital Treats Overtime, Error Problems. . .

By Stephen L. Priest
And Robert L. Sheehan
Special to CW

BROCKTON, Mass. — Hampered by an increased workload, understaffing and a cost-conscious management, a 322-bed not-for-profit community hospital here decided to expand its DP services without adding to already spiraling medical costs.

Brockton Hospital's DP department faced a challenge: to absorb additional data entry requirements while maintaining departmental costs within state-prescribed limits.

The hospital rose to this challenge by implementing a disk data entry system. This process involved conquering certain key-to-disk fears, overcoming vendor support problems and finally realizing a return on investment.

Brockton Hospital's data entry overtime was costing nearly $300 per month and that cost was rising. Efforts to control overtime were unsuccessful as rush jobs and production priorities made the additional hours necessary. The overtime was seemingly justified since the hospital's services and volumes expanded along with additional data entry applications.

A staffing study was completed and analyzed. It developed times for each data entry job and documented current volumes by applications. Subsequently, a calculation of data entry standard man-hours versus available man-hours demonstrated the need for an additional 40 man-hours per week.

The rush to complete jobs meant that verification was often skipped. The study clearly indicated why user departments were complaining of an increase in data-entry-caused errors.

Solutions Pondered

The first answer to the overtime and error-rate problem was obvious: more staff. However, although the administration was aware of the increase in hospital services and patient volume, its response was, "Sorry, no staff increases."

Another possible solution to the throughput problem was to replace keypunch machines with key-to-disk units. But we were skeptical of key-to-disk increasing strokes per hour, since the hospital's IBM 129 has buffered input and operators never exceeded the machine's speed.

The staffing study showed 10 hours a week were spent controlling source documents — matching input document totals with the computer output reports, correcting errors and checking batch counts. Since the literature is clear on the editing advantages of programmable key-to-disk equipment and key-to-disk costs are similar to the punched-card mode, we decided to evaluate key-to-disk data entry equipment.

The first step in selecting a key-to-disk vendor was to interview data entry vendors who sold both hardware and software products, compare their offerings and select the best package. However, although each vendor promised to solve all of our DP problems and deliver everything we asked for and more, none of the proposals exactly fit the hospital's needs.

Finally, we realized that we needed a request for proposal (RFP), clarifying to each prospective vendor just what was expected of the hardware and software.

After reviewing five proposals and visiting four sites, we chose a vendor. It was selected because it could provide immediate table lookup of 2,000 items, costs within present punch card budget and excellent customer references. The recommended equipment was a CPU with 72K bytes of memory, one 2.5 M-byte disk unit, one 9-track 800 bit/in. tape unit and four CRT stations.

Four-Step Plan

Implementation was planned for four steps. Step 1 would be the off-site orientation of the hospital data entry supervisor and programmers. The vendor scheduled a three-day school to explain the selected hardware and software capabilities.

The programming of one hospital application was to be included in the application software training sessions. This would provide system training and result in a completed application.

Step 2 was to involve the use of the vendor's hardware and programming staff to program the data entry applications prior to the equipment's delivery. The RFP stated that the hospital would provide programmers to learn the system software and to assist the vendor, but the ultimate responsibility for programming the system would be the vendor's. This was to ensure efficient application program techniques that are only acquired through experience.

One requirement of the conversion was that there be no duplication of data entry equipment cost. This prohibited the concurrent rental of punch card and key-to-disk units. In addition, there was to be a minimum of disruption to current data entry production.

Applications were supposed to be paralleled at the vendor's site using the hospital's data entry operators. With this approach, the operators would become oriented to the system, efficient data entry formatting techniques would be ensured and equipment delivery could be delayed until all applications were paralleled.

Using the vendor's site was sometimes a problem because of the limited availability of an experienced software adviser, and the limited machine time

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because of the vendor's numerous commitments to other customers.

When it became obvious that a better approach would be for the hospital's staff to do all the application programming, it was decided to bring the equipment on-site. This would eliminate travel time to the vendor's site and allow the hospital's programmers and data entry operators uninterrupted access to the equipment for testing and parallels.

The vendor agreed to furnish the equipment, and it was understood that the equipment acceptance period would not begin until the punch-card machines could be removed from the hospital.

Having the hospital do all the application software programming was better over the long run because the hospital's programming staff and data entry personnel are now experienced in using the system's full capabilities.

Step 3 was to go "live" when the daily and weekly applications were programmed, but with only two applications paralleled, the 2.5M-byte disk appeared to be 90% full. An investigation by the vendor revealed that the data entry personnel had not been instructed to perform a certain utility necessary to ensure efficient usage of the disk. The proper utilities are now being performed.

The system handles seven data entry applications (payroll, accounts payable, general ledger, inventory, discharged accounts/outpatient receivables, in-house census and cancer registry) with as many as 30 jobs per application, and the system is still operating at only 70% of capacity. This includes the previous day's work for backup in case of system or application rerun.

The RFP asked that all costs be stated outright, but the small print in the contract later revealed shipping costs, and additional costs were associated with the cables used to connect the CRT and CPU.

An acceptance criterion specified in the RFP established that the hardware and software be able to process two weeks' transactions while maintaining 97% uptime. Once the capacity problems were corrected, the criterion was easily met.

The hardware uptime and system software capabilities have exceeded all hospital expectations. Because the system includes a clustered CPU with no redundance, one punch-card machine is still kept on-site for certain applications and back-up purposes. However, backup has not been used, since the CPU has had 100% uptime in six months.

Step 4 was the refining of programs by the data entry and programming staff in order to get maximum use of the system's capabilities. The remaining monthly and annual applications are currently being converted to disk.

Full Endorsement

It was four months before the data entry operators "accepted" the change from card to disk, but today they would not return to punch-card input. Their fears have disappeared and now they fully endorse the system.

The productivity level of the data entry operators decreased initially, but after three months, the throughput returned to the pre-implementation level. A six-month follow-up staffing study using key-to-disk times showed an increase of 25% in data entry throughput for some applications.

One area of throughput improvement was in the entering of outpatient registration data. The punch-card mode of entry necessitated nearly four man-hours per day to enter and verify 250 registrations. Today the programmable key-to-disk equipment processes the same number of registrations in three hours.

The increase in throughput is attributed to many factors. First, the table lookup and editing features of the system allow immediate correction of operator errors while the source document is still available. Previously, the source document had to be relocated from storage before an error could be corrected.

In addition, the system's programmability saves many keystrokes. A Zip Code table has been put into certain jobs so that an operator need only enter the Zip Code, and the city and state are automatically entered by the system. When out-of-state or unknown Zips are entered, the system display city and state prompts.

Additional time is saved since only the Zip Code — not city and state — has to be verified.

Tables have also been used to confirm the existence of an item in an application. For example, nearly 1,500 8-digit numbers representing various patient charges. The instant the operator hits the eighth digit, the system accepts or rejects the item. A valid item causes no operator hesitation, while an invalid item causes the system to halt.

The system prompts have proved invaluable in training both new and experienced operators on new applications. The prompts resemble the source document in order of appearance and description.

Source documents difficult to punch because of inefficient data entry design can now be easily entered, since the system can accept data in one sequence.

Priest is the director and Sheehan is the assistant director of Brockton Hospital's Information Systems Division.

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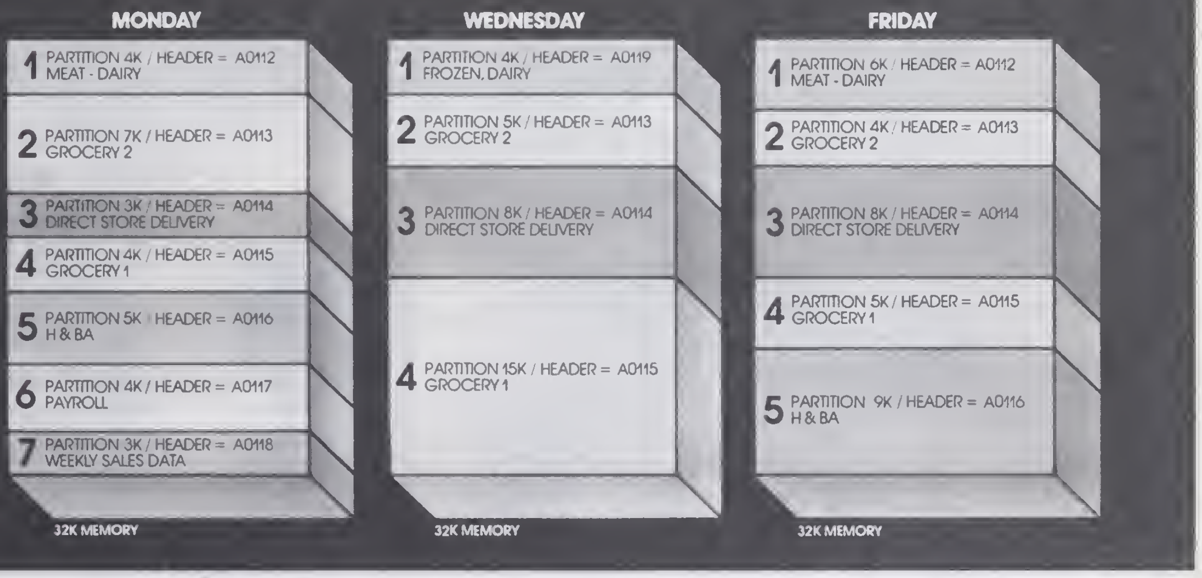
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5 PARTITION 5K / HEADER = A0116 H & BA
6 PARTITION 4K / HEADER = A0117 PAYROLL
7 PARTITION 3K / HEADER = A0118 WEEKLY SALES DATA
32K MEMORY
WEDNESDAY
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2 PARTITION 5K / HEADER = A0113 GROCERY 2
3 PARTITION 8K / HEADER = A0114 DIRECT STORE DELIVERY
4 PARTITION 15K / HEADER = A0115 GROCERY 1
32K MEMORY
FRIDAY
1 PARTITION 6K / HEADER = A0112 MEAT - DAIRY
2 PARTITION 4K / HEADER = A0113 GROCERY 2
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Data Entry Needs Identity Separate From DP

(Continued from SR/2)

bias. This would not be so bad except that the efficiency of a data entry department is rarely centered around the processing efficiency of the computer controlling the system. Any number of systems look great on paper, especially when viewed as computers, but are less than efficient from the perspective of the keying operation.

The vendors are not the only ones overemphasizing the technical capabilities of the new systems. Data entry is also developing its own brand of supertechnicians at the expense of the "people-awareness" that is critical to success in this field.

Nothing Saved

For example, a programming technique may reduce keystrokes but if keyboarding degradation results, nothing has been saved. Entry may even take longer.

In the rush to downstream processing from the mainframe, certain conditions can mean instant ulcers for a data entry supervisor. While the control unit is basically processing some data or another, other activities are slowed and even halted. Those other activities could mean monitoring the terminal activity or waiting to transfer data or enter a new format.

It is also possible to simplify a keying job to the point that it is boring. This could lead to a great many morale problems and, again, could end up costing more rather than less.

More Than 'Latest Gadget'

All of which is not meant to imply that technology has been bad for data entry; it hasn't. The field presents more opportunity and more challenge than ever before. Many creative technical and managerial features can and should be applied.

The point is, there is more to data entry than the latest gadget. The technical attitudes of DP are not directly transferable and may be counterproductive. Data entry is at a stage in its development where it is appropriate to establish a separate identity from DP.

But the presumption of a close association between DP and data entry has not been all for naught; both sides have benefited. Some analytical techniques developed within data processing are entirely appropriate for data entry (and other areas as well).

There is a strong "can-do," service-oriented tradition in both DP and data entry. Both are at the end of the line in the information production process. It is not unusual for them to be expected to take up the slack that may have been created earlier in the work flow.

The difference, again, is that data entry is restricted by people while DP presents more of a technical/equipment problem.

No Simple Answers

Yesterday's keypunch supervisor dealt with a straightforward, routine, well-structured situation. "Here's the work. This is when it's needed." Either it got done, or it didn't. The range of solutions was very limited.

Today's data entry supervisor must decide what the best solution is from a range of alternatives. The environment is more complex, more fuzzy. "Here's the work, this is when it's needed." But what is the best way to get it done?

Today's supervisor is not simply responding to the technical advances. He is also affected by the more general changes taking place regarding people at work. These changes are influenced by many factors outside the shelter of a company's walls and are likely to have a far greater long-term effect than technical advances.

Tomorrow's data entry professional faces an even more complicated world. Economics will dictate an even greater emphasis on general management skills to control a range of concurrent activities. There will also be more communication at higher levels with all areas within a company.

Data entry has been "invisible" within the protective shelter of DP for too long. It's time we were on our own.

Feist is the data entry manager at Spencer Gifts in Lakewood, N.J., and author of the book, Basic Principles of Data Entry Management.

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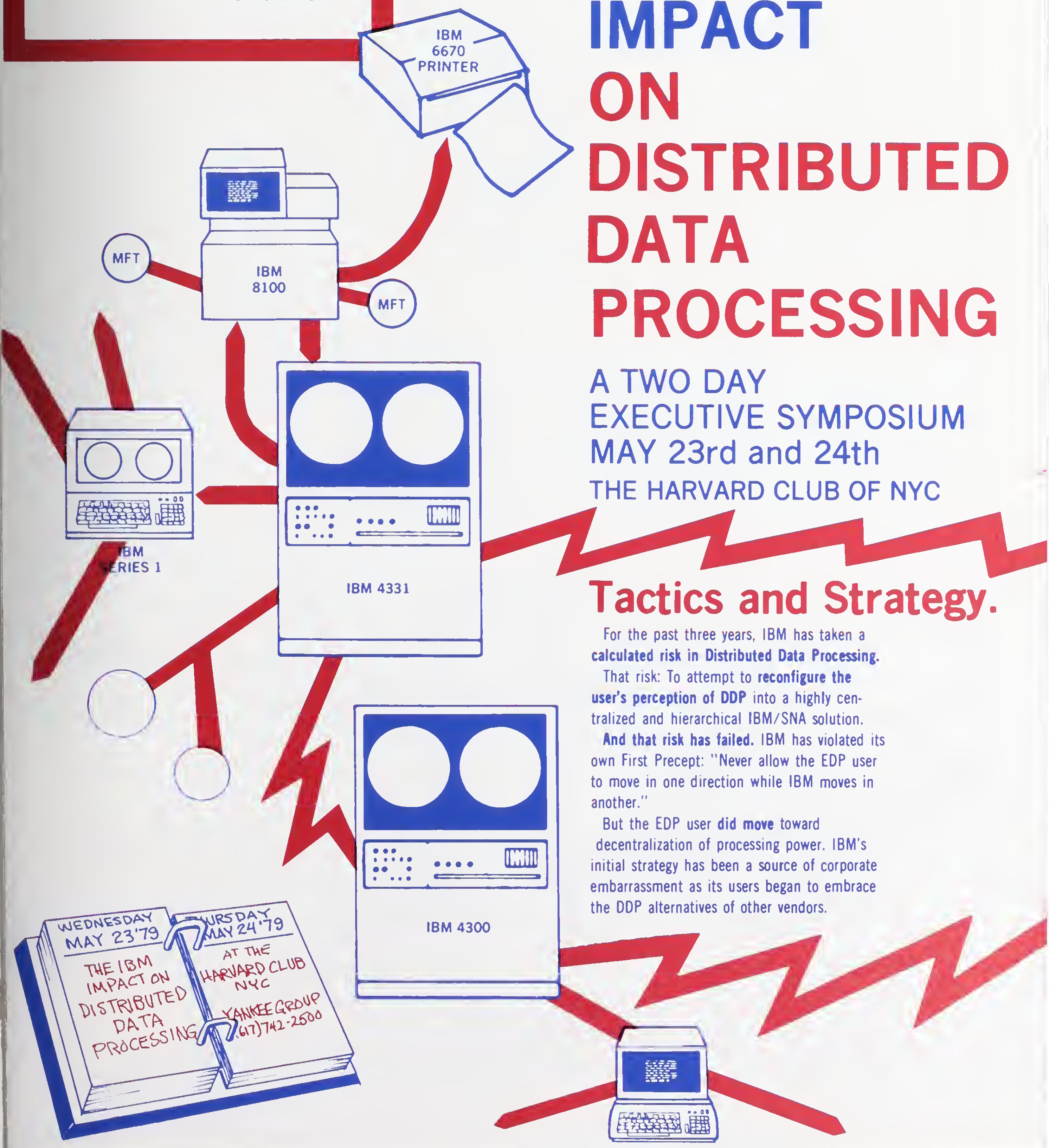

Tactics and Strategy.

For the past three years, IBM has taken a **calculated risk in Distributed Data Processing.**

That risk: To attempt to **reconfigure the user's perception of DDP** into a highly centralized and hierarchical IBM/SNA solution.

And that risk has failed. IBM has violated its own First Precept: "Never allow the EDP user to move in one direction while IBM moves in another."

But the EDP user **did move** toward decentralization of processing power. IBM's initial strategy has been a source of corporate embarrassment as its users began to embrace the DDP alternatives of other vendors.

Counterpunch.

IBM has suddenly embraced the Distributed Processing Concept - in its own, inimitable way — with a flush hand of **new DDP-oriented products.**

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- The 4300.
- The 6670 Information Distributor.
- The System 38. Expanded, better supported versions of System 34 and Series 1. Even quantity discounts on Series 1.
- Program support for remote processing.

...and there is more to come.

Although this hardware has set impressive performance/price standards, it is the powerful new IBM software, interface links, and microcoded extensions that are creating a formidable "iron curtain" for competitors.

But one thing hasn't changed.

All IBM roads still lead eventually to SNA, but there are now a number of interesting routes...

On May 23rd and 24th, the Yankee Group will present a conference on: "The IBM Impact on Distributed Processing."

This seminar is one you will insist on attending.

The goal of this conference is to explore IBM's impact on Distributed Data Processing from both a user's and vendor's perspective. We will examine IBM's current product and system integration strategy, and outline possible future scenarios. We will also discuss IBM's strengths and weaknesses in its DDP efforts, and how competitive alternatives — intelligent networks, minis, controllers, terminals, peripherals — can be interfaced into IBM networks.

Topics to be Covered

ALTERNATIVES TO THE IBM DDP STRATEGY

The Distributed Processing industry has had a **honeymoon** with users until now.

Before IBM's recent introductions, these vendors essentially had little direct IBM competition.

But they have it now.

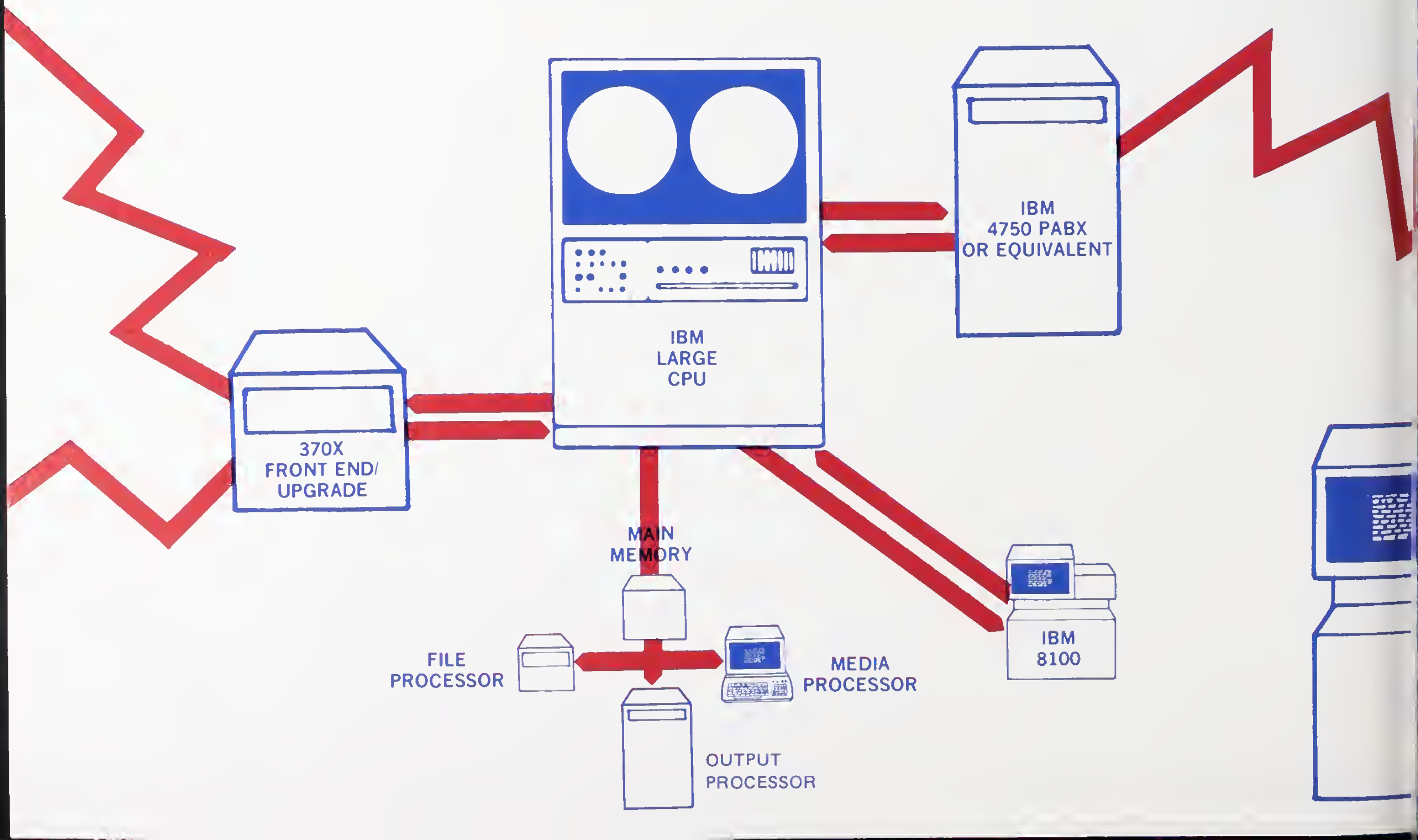
Within the scope of this seminar we will examine IBM's current product and **system integration strategy** and delineate future market tactics. Further, we will examine the specific strengths and weaknesses in the IBM DDP efforts and analyze how **competitive alternatives** — intelligent networks, minis, controllers, terminals, peripherals - can be interfaced into IBM networks.

FRACTIONALIZATION OF THE EDP MARKETPLACE

While the growth of traditional EDP continues its strong pace, Distributed Processing is undergoing an unprecedented surge. Almost overnight, DDP has lost its buzzword status ... and become a major force in EDP and communications. Moreover, users and vendors now realize that Distributed Processing **is** the future; by the mid-1980's intelligent devices will be ubiquitous, as will the virtual networks that support them.

Plans and strategies to support this environment must be outlined TODAY.

How will this market fractionate?



IBM AS A CATALYST FOR PRIMARY DEMAND

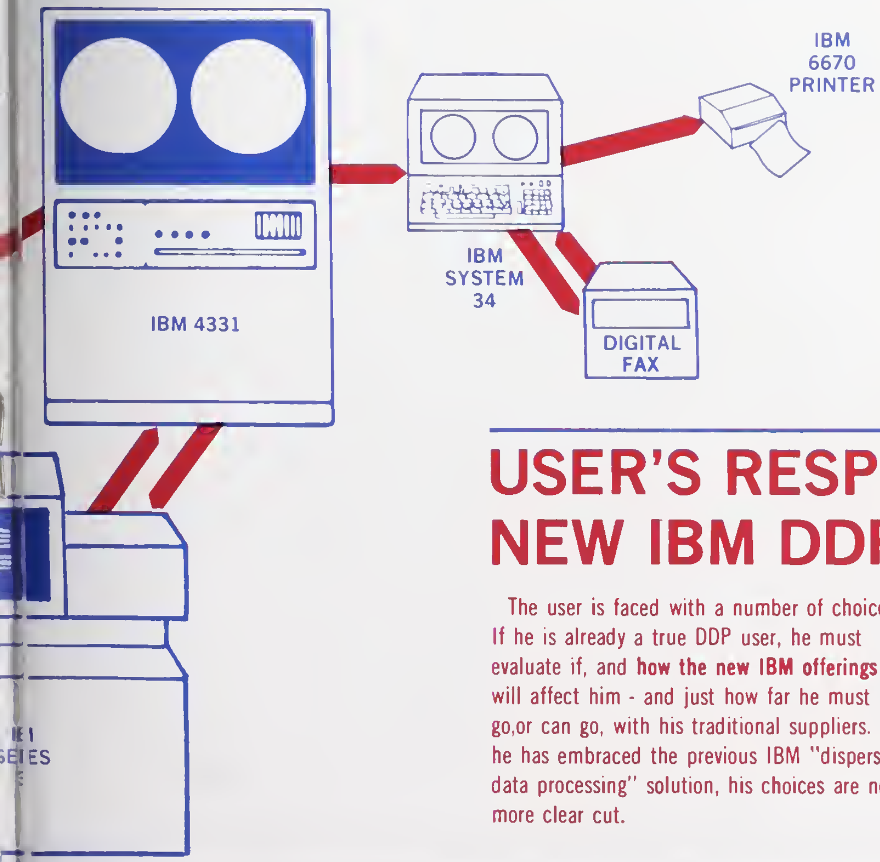
In any industry, there are two primary strategies that a vendor may follow to attack the market. He may either attempt to **take a portion of an existing market** or he can **increase the absolute size of the market.**

IBM will do **both.**

IBM is looking to dominate the major segments of the DDP market with a multifaceted approach that will keep vendors **and** users off balance. For example, intuitive logic would have predicted that IBM's General Systems Division (GSD) would spearhead the Armonk Giant's DDP effort.

Intuitive logic would have been wrong.

The Data Processing Division (DPD) will be selling DDP (8100, 4331, et al) to **top** management, emphasizing **coherency** with existing mainframe configurations. GSD will concentrate on lower level systems, and battle in the trenches with Datapoint, Wang, DEC, Hewlett-Packard, Four Phase, Data General, and many more. **What will be the impact on these companies? On users plans? How will users integrate their existing DDP nets with IBM's new offerings?**



THE IBM ARSENAL — QUESTIONS TO BE ANSWERED

How will DPD and OPD/GSD cooperate/compete in IBM's Grand Design? What interface links will be required? How will DDP impact IBM?

IBM/AUTOMATED OFFICE

What are IBM's plans for distributing "intelligence" to the Automated Office? PABXs, Multifunctional Terminals, Nonimpact Printers, Communications Controllers, Facsimile, Small Business Computers, and Word Processors are all part of its plans. How will these be integrated?

IBM 8100

What are the implications of the 8100 for DDP? What part will it play in IBM's future networking plans, in office automation? What is the significance of the "loop technology?" How will other vendors attach products to the 8100? **How** is IBM selling the 3730? Why will this cluge realize a modicum of success?

IBM 4300

How will the 4300 impact the remote computer user? What effect will the 4331 have on the **"mega-mini"** market? Where do the PCMs fit in? How long can they keep up with IBM? What future products can we expect in the 4300 class? **How** will SNA evolve from hierarchical to distributed?

What is IBM's marketing strategy for selling DDP? If IBM employs a top-down approach, what will happen to the organizational dynamics? Will management be distributed?

IBM AMMUNITION

How will GSD fit into this picture? Where does the S/38, S/34, and S/1 fit in? What about account control?

How will IBM use the **6670 Information Distributor** to displace competitive products? What are some of the future applications for this device? What will OPD/GSD do to regain a competitive edge in the word processing market?

When/where does facsimile fit into IBM's plans? How will IBM move on the PABX market? A high-end 4750 is a sure bet, but how about a smaller device — like the mid-range Rolm PABX?

Will IBM move to retail outlets for terminals, small computers, peripherals, and packaged software?

Will there be further quantity discounts on the Series 1 and future products? Will IBM get into the under-$10,000 intelligent terminal/computer market?

When? How?

What will be the effect of IBM's DDP strategy on DEC, H.P., D.G., Datapoint, Four Phase, et al.

USER'S RESPONSE TO THE NEW IBM DDP STRATEGY

The user is faced with a number of choices. If he is already a true DDP user, he must evaluate if, and **how the new IBM offerings** will affect him - and just how far he must go,or can go, with his traditional suppliers. If he has embraced the previous IBM "dispersed data processing" solution, his choices are now more clear cut.

Finally, if he is just now coming into the DDP environment he must balance out conflicting claims and a variety of very attractive hardware/software options. This seminar will bring together a number of **key users** who are currently making these DDP decisions.

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After System Upgrade

Firm Lowers Data Entry Errors, Raises Morale

By E. Faye Boninu
Special to CW

HAMPTON, Va. — The importance of data entry in computer operations has not been fully recognized. This lack of recognition has contributed to morale problems that create conflicts and lead to high employee turnover.

Some companies have attempted to resolve the problem through a variety of methods, one being the incentive or piecework concept that equates greater output with more pay. However, several problems have arisen with this type of operation.

First, it is difficult to administer fairly; pay scales often vary because of program, forms or equipment changes; and operators compete to process particular jobs that result in a high production level.

Calculon Corp., a support services contractor here that was formerly Auerbach Associates, Inc., is presently fulfilling a multi-million-dollar contract with the National Aeronatics and Space Administration's (Nasa) Business Data Systems Division here at the Langley Research Center.

Of the many support services provided, data entry operations are considered to be among the most important specified in the contract.

Plans for Change

At the award of the contract in mid-1975, the data entry staff consisted of 10 employees, nine keypunch operators and a working supervisor. This section was located away from Nasa and relied upon courier services to transport users' source documents and large volumes of punched cards to the computer center.

Nasa, aware of the problems associated with this arrangement, decided upon a two-phase approach to improving the overall operation. Its plan included an upgrade of the keypunch equipment to a key-to-disk system and the construction of a data entry facility immediately adjacent to the computer operations center.

The system upgrade was accomplished in March 1976 with the installation of a Univac 1900 Cade key-to-disk system. It consisted of nine keystations, a supervisory console, a teletypewriter printer, 96K bytes of memory, 4.5M bytes of disk storage and a tape unit.

In general, the procedure is as follows: Source documents are delivered by courier, logged to control records, segregated by type and assigned to the data entry operators.

Next, the operators select the appropriate transaction format from approximately 50 main formats and 100-175 subformats and key the required data to disk. Periodically, the disk transactions are dumped to magnetic tape and forwarded to the computer operations center for processing.

The system's upgrade has resulted in a reduction of data entry errors. While the number of keyed errors has always been minimal, the prevalidation capabilities provided by the new system have reduced them even further. In addition, overall production efficiency has improved to a level where the data entry staff has been reduced from 10 to seven employees.

The second phase of Nasa's plans, initiated during 1978, involved the construction of the data entry facility itself, which was completed in February 1979. With the move of the data entry section to the Nasa on-site location, operational efficiency has improved.

Operator Involvement

Calculon Corp. and the Nasa management have also employed other techniques to generate motivation and maintain operator initiative.

For instance, management provides for exchange visits with the various user groups within Nasa, exposing the data entry people to day-to-day user operations and working environment. Users, on the other hand, gain an appreciation for the complexity and multifaceted requirements of the data entry section.

Data entry operators are also encouraged to expand their knowledge of the key-to-disk system by becoming involved in understanding and programming the Cade system.

At the same time, operators are encouraged to participate in a company-sponsored programmer trainee program to advance their careers.

Because of these approaches, our operators demonstrate a high level of motivation and personal initiative. The turnover rate for the past three years has been zero. The reduction in staff as a result of the increased efficiency of data entry operations was offset by advancement of the operators to the programmer/trainee program.

Off-the-Wall Crisis

Even though our data entry project has been a success, we did experience one off-the-wall crisis that nearly pushed us into a corner.

We had been on key-to-disk equipment for about a year when we began experiencing some system errors. We ran our on-line system diagnostic tests and found no problems. We took system dumps and still found nothing.

After exhausting every alternative we could think of, we called the Univac

(Continued on SR/16)

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Voice Data Entry Handles Perishable Information Best

By E. Joseph Simmons Jr.
Special to CW

Traditional data entry consists of four basic operational events: generation, verification, rework and disposition. And although techniques may vary slightly with each application, accurate data flow is the essential ingredient to the efficient operation of any business.

The problems of accurate recording and timely data flow are particularly critical in information intended to support operational management, because at the operational level, perishability is a noticeable and integral part of each information unit. Although there is no standard measure of perishability, it is usually relative to the end user or decision-maker whose process the information is intended to facilitate.

Immediacy is the unique characteristic of voice data entry. Voice input has, in fact, the immediacy of the event itself. There are no preparatory or subsidiary requirements in voice data entry — no hand recording, keying, dependence on media input or, for that matter, unnecessary intermediate steps.

Not only does voice data entry combine in a single step the basic elements of data gathering, but it also results in cost reductions, increased productivity and job restructuring to the benefit of both labor and management.

In quality control applications, for instance, an inspector's hands are usually very busy. With voice data entry, an operator takes measurements and enters them by voice. Tutorial prompting is done by a display unit, according to a predefined sequence, and as an option, the operator can speak the field description, followed by the actual transmission information.

As each measurement is spoken, it is visually verified by the operator. Following that, the information is transmitted and then validated against the appropriate tables or data files which are resident on the host computer connected to the voice data entry terminals.

The inspector is notified instantly on that same display if specific fields or parameters are out of tolerance and, if so, how far out. If all the fields check out, acceptance notification is given, the appropriate statistics are updated and transaction records are created within the host CPUs.

Basic Benefits

The characteristics of this type of system are peak operator throughput, instantaneous feedback of operational information that helps run the plant, identification of defects early enough in the production process to prevent scrap production and the elimination of the data entry bottleneck with its associated costs.

Prior to the use of voice data entry in such an application, an operator would take a measurement with a device in one hand and the object being measured in the other hand. He would then put both objects down, pick up a pencil and record that measurement on paper.

With voice entry, the operator can inspect twice the number of items because there is no need to write down the measurements. In addition, validation and verification are done dynamically, as the operator enters the data, against information stored in the support processor. Action reporting is automatic because the appropriate error messages or exception reports are fed back immediately.

While there are other methods that produce certain desirable cost and time-saving benefits, voice data entry provides a wealth of advantages. For example, only voice really records data at the source, the instant an event occurs, and also allows operators to enter data while the hands and eyes are busy.

Voice also brings the power of the

(Continued on SR/16)

Voice brings the power of the computer to the operator in an understandable, personal way.

WHY WOULD
A COMPANY PAY
GOOD MONEY
FOR AN
ENTIRE PAGE
AND THEN LET
PART OF IT
GO TO
WASTE?

Reduces Keystrokes, Errors

Key-to-Disk System Has Strong Edit Features

By Kevin Rardin
Special to CW

CHICO, Calif. — The ideal solution to data entry would be a sophisticated computer system that would understand speech, talk to the user, read written notes and print out impeccable results. But don't hold your breath waiting for such an elegant solution to what is often a mundane problem.

We are lucky there are people willing to sit at keypunches and CRTs throughout the day, typing codes and numbers. But mistakes are inevitable and can often cost precious time and, therefore, money.

It is often worth the trouble to construct a system that helps eliminate human errors, makes the data entry job faster and involves fewer keystrokes. At California Computer Timesharing Co., we feel we've accomplished that with our data entry program.

We operate a local time-sharing firm that services the delightful community of Chico, Calif. We supply the usual accounting, bookkeeping and payroll system a small town needs. Our data entry program has evolved over the last six years of satisfying our clients' demands for better data entry.

The program is a universal data entry and file maintenance system called Entry. All of the user systems connect with the Entry program for file building or maintenance. It is possible for one data entry operator to enter and edit up to 500 seven-field journal entries per hour. This is at least twice as fast as the next best alternate method and three times as fast as traditional methods.

Entry is a direct key-to-disk system and was designed for use on a printing terminal such as a Digital Equipment Corp. Decwriter or Xerox Corp. Diablo. It runs on any Ascii terminal or CRT terminal. A screen-formatted version is currently under development for exclusive use on CRT terminals.

For a relatively powerful data entry system, it is quite simple to use. All commands are in meaningful English but only the first three letters of a command need be entered. Briefly, this is how it works:

After summoning the Entry program from the system library and giving the usual execute command, RUN, the operator is at once in the KEY mode of operation. This is the command language level.

Indication that the program is ready to accept commands is given by a right arrow (°). An accumulator may be initialized by entering "ACC" and indicating the field to be totalled. This may be alternately used to balance input as well.

The next step is to enter the line mode by simply entering "LIN." The program now accepts lines of data with fields delimited by commas. A file may now be created and edited.

Entry ordinarily generates its own line numbers as the operator enters data. An additional command, "DATA," allows the user to enter lines anywhere in the file by simply designating the line number, a dash and following with the data for that line. This is useful for replacing lines and writing over old data with new.

'Ditto' Function

Another unique feature of Entry is a "ditto" function, which allows the user to duplicate entries from one line to the next when needed. If a comma is inserted into the line, Entry copies the data from the designated field in the previous line into the current line or successive lines.

The file may be edited at any time during the data entry process. Entering the word "KEY" in any mode returns the user to the command language level. The user may add data to the beginning and ends of lines and even insert entire lines within an existing file.

The FIND command in the edit routine searches for designated strings and displays the line. Deletion of lines and data is also available.

A simple PACK command renumbers the file and deletes blank lines. If a user has a seven-field file which is used in one program and wants to use the same file for a program processing six fields, the TRUNCATE command removes the last field from all lines (assuming the last field is not necessary for processing).

The REPLACE command exchanges old data with new at the touch of a few keystrokes, anywhere in the file.

Whenever a correction is made to a file, it is displayed for verification by the operator. This function may be turned on or off by entering "VON" or "VOF."

Strongest Feature

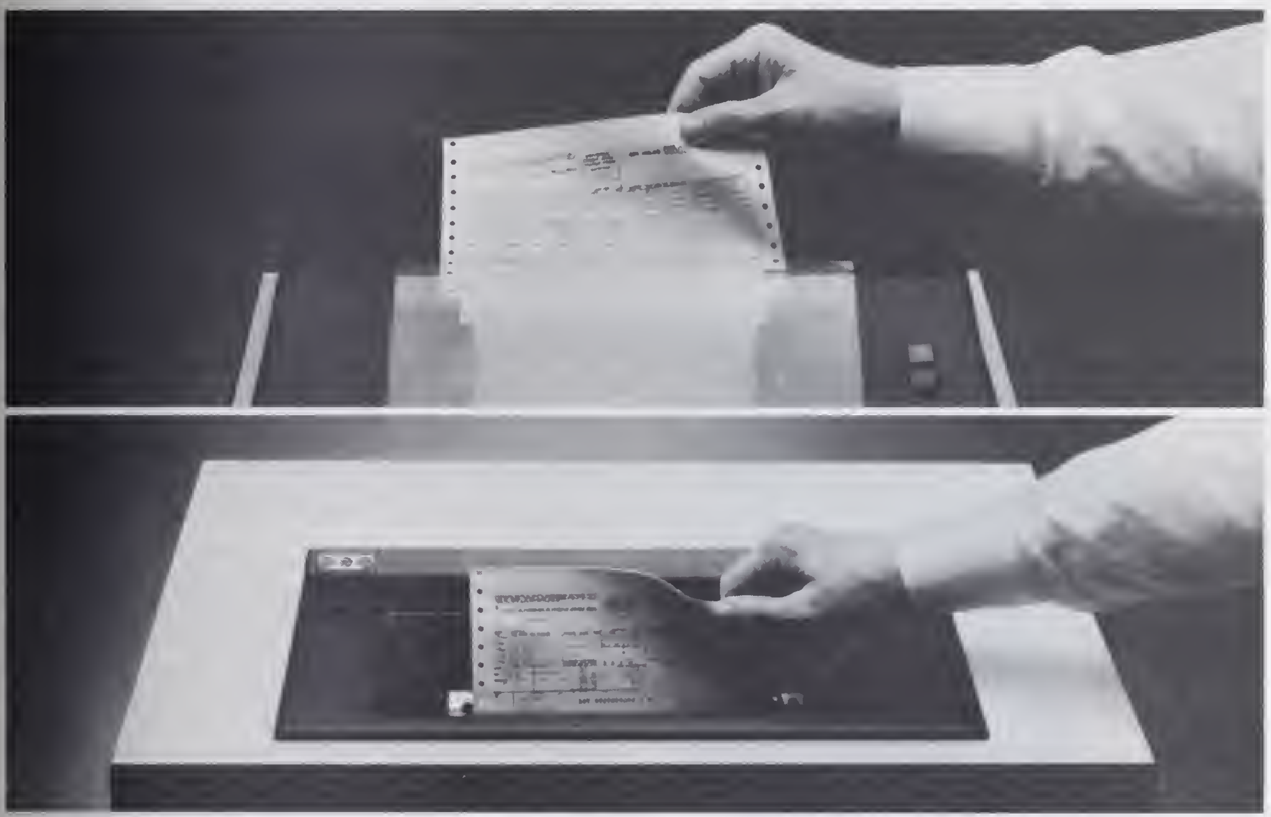
The edit features are perhaps the strongest element of this data entry program. What this means to an average user is fewer keystrokes. This increases the amount of data an operator can enter and decreases the number of errors.

Once a file has been created, it can be modified and updated easily and efficiently. An entirely new file does not need to be created as is often the case with traditional data entry methods.

The accumulator is another feature

(Continued on SR/19)

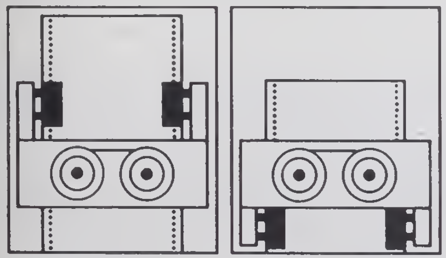
WE DON'T KNOW.



If your company doesn't use the Teletype* model 40 Forms Access printer for orders, labels, invoices, billings, tickets, or any "on demand" printing, then it's likely you're wasting paper.

And wasting paper is wasting money. Especially when you're printing those expensive multi-part forms.

But the model 40 has a unique paper feed mechanism, so it saves paper. And money.



Theirs. Ours.

On conventional printers, the paper feed mechanism pulls the form through the printer from above. That means, to get at the form that's just been printed, you have to feed it out past the feed mechanism. And along with it comes the next form.

When you need the printed form right away, that can mean wasting every other form.

But the Teletype model 40 works differently. The paper feed mechanism is mounted below the printer, so the paper is pushed into the printer from below. You can print from the very top to the very bottom of the form, tear it off, and never waste or destroy the next form.

You can print anything from a single label to a multi-part invoice on the model 40, at 300 LPM. On forms ranging from 4¼" to 9" wide and from 2½" to 22" long. And the copy is always clean and sharp even on the last carbon.

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Voice Data Entry Handles Perishable Data Best

(Continued from SR/14)

computer to the operator in an understandable, personal way that requires no special training or familiarity with DP technology. In addition, manufacturers have found that when a nontypist factory or clerical worker has to enter strings of alphanumeric data, voice provides a lower incidence of pause and error than keyboard.

Not Keypunch Replacement

However, voice is definitely not a keypunch replacement since it cannot compete with the speeds of an intermediate key-entry operator. Rather, voice seeks to eliminate the intermediate data preparation step by going directly to the source.

Another area where voice data entry demonstrates savings and increased productivity is material handling. The voice technique fills a void because its permits material handlers to use both hands, keep pace with a conveyor system and enter data simultaneously.

For instance, in certain sortation systems, an operator places a package on a programmed conveyor belt for transportation to a truck bay or storage area. The operator can then speak the destination code into the terminals. The code is converted to a digital signal and is used by the conveyor system to route a carton to its correct destination.

Voice data entry offers one other feature that is particularly useful in material handling applications: wireless transmissions. There is no need for hard-wired connection between the microphone operator and the voice translator/terminal.

Voice data entry offers complete freedom of movement. The only hardware requirements are a very lightweight headset and a small cigarette-pack-size transmitter.

Achieving Feedback

Feedback to the operator can be achieved by voice response, by a portable wireless display (since an operator is sometimes outside the range of a fixed display), by multiple displays in parallel or by very large displays strategically placed.

Voice-oriented applications, however, are not limited to industrial and manufacturing settings. Prototype voice-actuated wheelchairs and environmental control units have been designed and delivered. These units enable individuals with serious spinal cord injuries to turn electrical appliances and devices on and off, to dial telephones, to type letters and to control movements and other environmental situations.

To achieve widespread marketability, the current thrusts are to reduce prices significantly and repackage the voice-oriented units.

Interactive Graphics

In another example, voice data entry has been in use in interactive graphics for more than two years by both governmental and industrial customers.

Voice data entry is the most dynamic and innovative concept of the microcomputer period. Its current and projected uses, as well as its advantages, are impressive. There are no preparatory or subsidiary requirements once the system has been installed.

Few commodities are more perishable than information. Data that is essential at any given moment to the decision-making process in accomplishing a specific task may be of little use later.

Because of its immediacy and direct application, voice data entry addresses the problem of perishability in data entry, and it does so with emphasis on timeliness and accuracy.

Simmons is the marketing vice-president of Threshold Technology, Inc. in Delran, N.J.

Errors Down, Morale Rises

(Continued from SR/13)

engineer, who ran his off-line system diagnostic tests and also found nothing.

Since we were still able to operate and needed to get back on schedule, he left promising that if we had more problems, he would be back to run more extensive tests.

The next day we were unable to bring up the system. The engineer returned and did a complete maintenance check, even going into the fixed disk unit. There, he found strange things: cracker crumbs, bits of fuzz, and, possibly, the answer to our problem — mice droppings!

We immediately informed the owner of the building, who brought in an exterminator to remove the homesteaders.

Three Days Later

Three days later, we were still experiencing problems. It became necessary for the engineer to stop every morning and completely disassemble the disk drive to vacuum and clean it.

The poison was obviously not the answer as we were still finding foreign particles and the poison scattered on the disks. We knew we had to take more desperate steps and had even given thought to "renting a cat."

We finally decided to put mousetraps directly on the disks. We caught two offenders the first two nights and since then have had no problems.

E. Faye Boninu is the computer operations supervisor at Calculon/Nasa's Business Data Systems Division.

"Up and running at

"Peugeot, producing 2.5 million vehicles a year, is now the third largest automobile maker in the world. Domestically, Peugeot needed a comprehensive data base-oriented financial reporting system that could be implemented quickly, with the least amount of impact on data processing and accounting staffs and resources.

"We did not want to 're-invent the wheel', and after a thorough review, we selected Software International's Accounts Payable software package to start. We planned to follow that with their General Ledger a year later, but since Payables went in smoothly in only 60 days, we installed the Ledger six months ahead of schedule.

"In the intensely competitive American automobile market we rely on data processing to help us be as efficient as possible. The combination of Ledger and Payables Systems provide excellent control for U.S. operations, while allowing us to meet special European accounting requirements accurately and thoroughly. In addition, we have greater flexibility to use our data processing skills for problem-solving unique to Peugeot Motors of America."

James F. Miller
Assistant to the President
PEUGEOT
MOTORS OF AMERICA, INC.

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"It all adds up to more than just software. Call or write today, and see how easy it is to get the complete systems that achieve results."

Donald K. Lane
President, Small Business System Division
Software International Corporation

Handles Encyclopedia Revision

For Publisher, ‘Data Entry Begins at Home’

By David M. Hursh
Special to CW

WILMETTE, Ill. — Some of us in the publishing and computerized typesetting industries think that, right next to charity, data entry begins at home.

First, here’s a little historical perspective. An associate who works for the country’s largest commercial printing firm once told a national seminar audience that "the best input is no input." After years of struggle with many methods of data entry for composition purposes, while working for a Printing Division subsidiary of American Can Co. and after using paper tape, punch cards, key-to-tape and foreign input from Korea or elsewhere, I was tempted to agree with this outlook.

Then in 1971, we were faced with the challenge of producing a large portion of the totally new *Encylcopedia Britannica* revision by computer, a task even more complex than producing various dictionaries and Bibles, which we had already done.

Imagine the character coding requirements for inputting the Anglicized versions of all the European languages and their individual accents, plus Arabic, Vietnamese and others — more than 4,000 separate characters in all — on a regular typewriter keyboard.

In addition, more than 100 unique character combinations were required to code certain elements of text for editorial retrieval, and another 50 or so were used to identify specific typesetting functions, since most data entry for publishing is free-form rather than fielded.

Impossible? Not if you don’t know any better. During the next two years, millions of words were economically captured by a subcontractor who used optical character recognition (OCR) type-and-scan techniques and the "cottage industry" approach.

Experienced typists, working at home with IBM typewriters and a standard OCR golf-ball element, learned to interpret all the coding requirements and then keyboarded the manuscript.

After scanning, a computer printout was proofread and corrected. Then a magnetic tape of raw data was returned to us for Videocomp processing, using RCA’s Page-2 composition system. Several additional proofreadings of typset output were also required, depending on the quality of the subcontractor’s work.

Search for Accuracy

Eventually the Britannica task was accomplished, and the scene shifts in 1974 to a legal publisher, Callaghan & Co., that had been a customer of ours before we ourselves joined Callaghan.

Callaghan’s need for highly accurate typesetting led the firm to explore a new approach to data entry for publishers.

Everyone is familiar with the keypunch/verify method for achieving very accurate input; Callaghan’s adaptation of this method was for two different typists to key manuscript onto tape cassettes using Datapoint Corp. CRT terminals. These two cassettes (Version A and Version B) were then program-compared, character by character, on a third "verifier" Datapoint terminal operated by a skilled proofreader. Any discrepancy between the two versions was displayed on the CRT screen, and the verifier operator then reviewed the source document and selected the correct version.

In mid-1976, the results of eight years’ experience were finally brought into focus on the continuing problem of data entry. Our computerized composition systems were ready to move into high gear, but the problem of attracting and keeping skilled full-time Datapoint operators became critical.

Concurrent with the exercise of choosing our first in-house computer system, we decided to start up our own type-and-scan function with home workers.

The operation began in February 1977 with the hiring of an excellent supervisor and about 20 experienced typists who wanted to work at home. This was not too hard, since the advantages for home workers are obvious: no commuting, no hidden employee expenses and the convenience of working the hours desired at a time that is convenient.

We provided brand-new IBM Selectric II machines with the "modified Perry" OCR golf-ball element, one-time carbon ribbons and a stock of good bond paper.

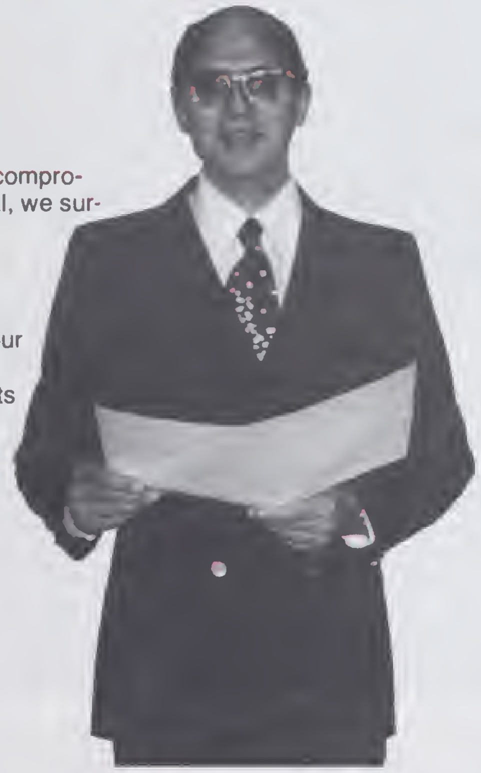
We also provided 30 hours of paid training to cover the particular requirements of data entry for legal publishing and made messenger arrangements to drop off batches of manuscript and pick up finished work.

Scanning Start-Up

Meanwhile, we had ordered a Compuscan, Inc. Super Alpha OCR machine with a magnetic tape interface for a Kennedy Co. 9300 tape drive. It arrived in April, and after several months of start-up experiments and equipment shakedown — during which time the home typists continued merrily along — we began to run the scanner full-time. Before too long, we had worked through the 10,000-page backlog and dropped back to a com-

(Continued on SR/19)

Peugeot in sixty days.”



"There was no need for either accounting or data processing to compromise with either system. Prior to choosing Software International, we surveyed their customers and our ‘Big 8’ auditors, and were well-satisfied with reliability, field support and system performance.

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In Sight Verification Jobs

Detached Programs Cut Operator Waiting Time

By Jim Bivins
Special to CW

DALLAS — While Omega Optical Co., Inc. is currently using several methods of data entry, the foundation of all our systems revolves around two basic concepts: internally run or detached programs and passing data through memory to each program.

When data entry jobs have to incorporate a sight verification procedure, one of the major concerns is retrieving data fast and displaying it so the operator can sight verify the data and continue. The following technique cured the problem of data entry operators twittling their thumbs waiting for a response to verify an entry.

Omega is using a Digital Equipment Corp. PDP-11/70 with 512K bytes of core memory and 352M bytes of on-line disk storage.We also have 32 on-line terminals and are using the RSTS/E operating system with the Basic-plus language.

Omega uses a detached program for each of its indexed files. These programs sleep, putting no overhead on our system until a data entry job needs data verification. The data entry job sends a request to the appropriate detached index job.

The index job receives the request, processes it and sends back a found or not-found answer to the requesting data entry job.

The data entry job may then retrieve the required data from the appropriate file and display it for sight verification. In many cases, we have gone one step further by having the detached index job retrieve the required data from the appropriate file and send the actual data instead of a file location. This keeps the entry job from having to retrieve any data from a file.

> *'When data entry jobs have to incorporate a sight verification procedure, one of the major concerns is retrieving data fast . . . The following technique cured the problem of data entry operators twiddling their thumbs waiting for a response to verify an entry.'*

Detached Programs' Advantages

Using detached programs means less code per data entry program, less file opens per program, less file contention between jobs, less memory space used per job, fewer file gets per data entry transaction and better overall system performance.

A disadvantage, however, is that the data entry programs are dependent on the detached indexing jobs. If the indexing job or jobs go down, the related data entry jobs go down.

But the programs' use leads to one goal: Giving the data entry operator better response when verifying data.

Speed is also a major concern on the other side of the coin. When data has been entered, the data entry operator must wait for it to be processed before starting the next entry cycle. The following describes the method used to eliminate this wait.

This involves a detached program that processes the data. These programs also sleep, putting no overhead on our system unless initiated. This means when the entry cycle has been completed, the data entry program immediately starts the next entry cycle. There are several methods in which to do this:

- Have the data entry program write the data into a temp file and set an in-use flag in an index block for the temp file. Then the detached program can search an index block, periodically, to see if a record has been written. If it has, then retrieve the data and process it.
- Have the data entry program write the data into a temp file and send the temp file address to the processing job. The processing job can retrieve the data from the temp file and process it.
- Have the data entry program send the actual data to the processing job. The job processes it.

Anyway you look at it, the data entry job is left free to do what it was intended to do — capture data through a terminal.

The advantages to these methods are the same as those discussed above. But, if the first method is used, there will be a small drain on the system when the processing job, periodically, looks for data to process.

And if the message method is used, then again the data entry program becomes dependent on the processing program. This means that if the processing program goes down, the data entry programs go down.

So far, we have discussed the internal programs which solve some of the critical areas of the data entry program.

Now let's consider the actual data entry program and some of its enhanced features.

First, data entry programs run as stand-alone or multiterminal programs.

Stand-alone programs are used for special purposes. They enter a low volume of data and need only one terminal.

Multiterminal programs are used for high-volume entry. This technique gives us the capability of having several terminals operating under the control of one program.

The RSTS/E multiterminal service gives us the ability to assign any or all of our terminals to a particular program. While they are assigned to this program, they cannot be used for other purposes. For this reason, an application with high-volume entry must be used so terminals will not be tied up unnecessarily.

RSTS/E has some very nice enhancements for screen entry. We use direct cursor addressing coupled with a special terminal mode called echo control. This gives us the ability to design some exceptional looking and extremely flexible data entry screens. We can define a character which is used to outline the length of a field.

If a delete is entered on the field, the character is re-echoed so the operator always knows what part of the field is used and not used.

We use programmable escape sequences.These are function keys that can be programmed to do specific jobs with just one or two keystrokes. They are highly effective and make data entry fast and reliable.

We set up arrays to define parameters for each field so a maximum amount of error checking can be done on each field.

Jim Bivins is DP manager at the Omega Optical Co., Inc. in Dallas.

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Book Publisher: 'Data Entry Begins at Home'

(Continued from SR/17)

fortable half-shift scanning rate.

Production totals for 10 months in 1977 were 83.4 million characters of input at a cost of $.569 per 1,000 keystrokes with all depreciation and overhead fully absorbed. On that performance, we added 10 more typewriters in 1978, for which we did not need to recruit typists; a waiting list of friends and relatives had developed as a result of favorable comments from our first home workers.

Production totals for 1978 were even better: 207.8 million characters at a fully absorbed cost of $.438 per 1,000 keystrokes of input. Cumulative figures for 22 months are 291.2 million characters at an average cost of $.476 per 1,000 keystrokes, and today we continue on at more than five million characters per week, with a staff that varies from 25 to 30.

We calculate conservatively that the $60,000 of capital equipment outlay was recovered in 1978 alone, and gross savings in two years will far exceed $100,000. We have quadrupled our capacity and additional increases in capacity can be made easily by adding more typewriters.

Output Comparison

Ah, but what happened to double-keyboarding/verifying? It too has benefited by separating jobs into batches and getting away from the one-operator/one-terminal concept.

We now have small batches of manuscript typed twice by different people. Scanner output tapes are "compared" on disk, character by character as before, but the comparison is done entirely by computer.

All discrepancies are printed out, along with the good text, for proofreader review.

Now, for rapid turnaround, the printout can be separated into as many pieces as there are readers available. And now, selection of the correct version is done with a single-function key at a CRT terminal that is on-line to the mainframe.

Another feature of our OCR data entry reflects the philosphy of Art Schieber, who has been responsible for much of the systems design. While many typesetters and publishers use copious manuscript markup as the key to successful composition output, Art thinks "no markup is good markup."

Data entry often becomes more costly in proportion to the amount of complex external markup, which in itself is expensive and may also be wrong.

In our system, the typist puts in simple codes, and then the "compare" program catches judgment errors as well as keystroke errors.

Accordingly, after the "compare," a post-processor program analyzes extremely simple "common code" patterns, as they were independently typed by the home workers. The program converts or expands these codes according to the different text elements and, in some cases generates text automatically.

In summary, this most recent data entry endeavor has been highly successful for our application. Now, it should also be recognized that there is a certain amount of administrative work involved with home workers (we scrupulously observe all state and federal regulations), and several of the programs are quite sophisticated.

The concept, however, remains beautifully simple: "Data entry begins at home."

Hursh is the vice-president of manufacturing and DP for Callaghan & Co., 3201 Old Glenview Road, Wilmette, Ill. 60091.

System Boasts Strong Editing

(Continued from SR/15)

not ordinarily found in data entry programs. With this command, the key operator can verify his entries against the totals on reporting forms. The accumulator is initially set to zero but can be set to any value by simply entering "TOTAL=" and the value.

If it is nearing break or lunchtime, a user can ask for the total, exit the program, and leave. When he returns, the accumulator will pick up right where it stopped.

Our clients are genuinely satisfied with Entry. Here are a few of its most popular features:

- A user can repeat data fields from line to line by simply entering a comma where the "ditto" field should occur.
- A set of simple English commands allows the user to alter the input file by addressing individual lines, groups, strings or the entire file. A user may also correct errors, enter or modify blocks of repeating data.
- All commands are in meaningful English, the first three characters of which need be entered.

The conceivable applications of Entry are numerous. As a direct key-to-disk system, it completely eliminates the use of punched cards. If cards are required as a storage medium, the system can be front-ended to an intelligent terminal along with a card punch to produce flawless output.

To save time, cards need not be individually keyed in order to update or modify a file. The file is simply modified in memory and the cards output.

Rardin is a technical writer with the California Computer Timesharing Co., 563 Country Drive, Chico, Calif. 95926.

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Kraco Enterprises, Inc. is one of the country's largest manufacturers and distributors of automobile radios, CB radios, and accessories. To help service its thousands of customers worldwide. Kraco has installed a Series 21 distributed processing system from Mohawk Data Sciences. This compact, easy-to-use system not only handles order entry, billing, inventory control, and payroll at Kraco headquarters, but communicates as well with the mainframes of its distant customers.

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5. Are there one or more special functions you need to make your job a lot easier?	☐	☐

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Four-Phase Adds Systems/IV Processors

CUPERTINO, Calif. — Four-Phase Systems, Inc. has added two mid-range offerings for users of its Systems/IV hardware, the IV/60 and IV/65 distributed processing systems.

The systems, to be publicly announced today, both come with 192K bytes of memory and 5M bytes of fixed-disk storage. Additional disk storage — 12.5M bytes or 22M bytes — can be attached to the system.

The systems, which the company stressed are an "alternative" to — but not plug-compatible with — IBM's recently announced 8100 systems, were said to be totally compatible with other Four-Phase hardware and software products. In its announcement, the company accepted four particular uses for the hardware: data entry, stand-alone processing, word processing and central inquiry.

Communications Controller

At the same time, the company announced a hardware communications controller, the 8450. The product, said to be designed specifically for Hasp communications, also allows for concurrent Four-Phase operations of 2780/3780, Systems Network Architecture 3770 or 3270 protocols.

Production deliveries of the IV/60 and IV/65 systems are slated for September, a spokeswoman said, while the 8450 is scheduled for delivery in the second quarter of the year.

The chief difference beween the IV/60 and the IV/65 is that the former will support a maximum of eight CRTs, each of which can hold a maximum of 1,920 char., while the latter can drive up to 24 such terminals, the spokeswoman noted.

The 192K-byte IV/60 leases for $852/mo on a one-year lease; that figure includes 5M bytes of disk storage, a single CRT, full communications capabilities, and the company's entire software support package.

A IV/65, similarly configured, leases for $1,062/mo. The IV/60 sells for $62,005, while the IV/65 sells for $74,365 (both with one CRT).

The System IV/60

The controller introduced by the company will lease for $350/mo, also on a one-year lease, with first deliveries scheduled for June. The company is at 10700 N. De Anza Blvd., Cupertino, Calif. 95014.

System Eats Up Quaker's Data

By Jay Woodruff

CW Staff

CHICAGO — When Quaker Oats Co. decided to internalize most of its time-sharing operations, it didn't drastically change the way time-sharing was used but it did make things easier to run and improved the company's DP capabilities.

Until last April, Quaker was on-line to a variety of companies providing dissimilar time-sharing services to its plants and divisions throughout the country. Although the different services satisfied user needs, such a non-standardized operation lacked flexibility, it prevented the company from shifting personnel from one time-sharing operation to another when it would have served the company's needs, according to Quaker's director of information services, Donald Stunoff.

Quaker decided to switch to an in-house system two years ago. At that time, it was using services from General Electric Co., Honeywell, Inc., Control Data Corp. and others, and it was spending about $1 million a year on them.

Since the installation of the system, time-sharing costs remain about the same, but Quaker's computer capacity has undergone a "substantial increase," Stunoff said.

The DP center converted about 2,000 programs for use on the Burroughs Corp. based system, and it began operation last April.

The system is based on a Burroughs B7700 dual processor with 4.5 bytes of main memory and four paths via two I/O units to 3G bytes of disk storage. The system is on-line to 2G-byte B866 remote job entry systems and data concentrators throughout the U.S.

Time-Sharing Network

The time-sharing network consists of 22 lines supporting more than 100 users. Two data communications processors handle 90 line adapters to remote terminals.

This terminal configuration also includes 39 Teletype Corp.

(Continued on Page 66)

Memory Announced For Decsystem-20 Units

MARLBORO, Mass. — Solid-state, add-on memory for the Digital Equipment Corp. Decsystem-20 processors will enable users to increase memory on some systems as much as three times, the company said. The recently announced solid-state memory replaces the older core memory, which the company has stopped manufacturing.

The MOS memory, selling for $65,000 for the first megabyte and $220,000 for five additional megabytes, will be delivered to users in July, a spokesman said. Using this memory, the maximum amount of storage that a Decsystem 2040 or 2060 can support is 6M bytes.

In addition, installed Decsystem-20 processors can be field-upgraded with a kit available from the company. However, the two types of memory cannot be mixed.

The solid-state memory will result in higher system performance, increased reliability, maintainability and availability, a spokesman said.

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FPS User Group to Hold Annual Meet May 7-9

BEAVERTON, Ore. — Users of Floating Point Systems, Inc. (FPS) hardware will hold their annual meeting at the Dutch Inn Resort at Lake Buena Vista, Fla., May 7-9.

Technical papers scheduled for presentation fall into three areas: application papers, systems software and theory and FPS hardware and software developments. Included in the hardware and software sessions will be papers on new math library routines for FPS hardware and an I/O processor.

Applications papers will discuss "High-Speed X-ray Image Processing Using the FPS Array Processor," "Application of an Array Processor for Sparse Elimination in Reservoir Simulation" and "Landsat Image Warping on the AP-120B."

Conference registration costs $100 for members and $130 for nonmembers. More information can be obtained from Floating Point Systems at P.O. Box 23489, Portland, Ore. 97223.

System Brought In-House, Devours Data

(Continued from Page 65)

terminals. Within headquarters itself, nine TD 831 display terminals are used for on-line interactive program development, Stunoff said.

The 24-hour-a-day shop works three shifts of about 100 persons, divided equally between systems and program development and operations, the DP director said.

Time-sharing, which takes up 20% of the DP center's budget, is used by industrial engineering personnel at Quaker facilities throughout the country. Management science uses time-sharing in operations research or product research laboratories, usually working from hard-copy terminals, the DP director noted.

CRTs are used at workstations not only for program development, but also for entering sales orders from four regional sales offices. Inventory and production transactions are submitted from manufacturing plants.

Interactive program development performed over the time-sharing networks includes commercial applications in manufacturing, accounting, and purchasing, as well as local program development to satisfy local plant needs, he continued.

"There is also program development in the scientific disciplines by operations and marketing researchers," he said. At headquarters, the center tends to concentrate on developing permanent applications for company operations, he added.

Market Planning

Half of the time-sharing budget goes to market planning, which provides on-line marketing information to all grocery products brand groups and to the marketing information department for use in decision making, Stunoff said.

The marketing people have been pleased with the switch. "It gives us the same information as the outside systems did — shipment trends, market shares and advertising levels — we find that we are able to run analyses and comparisons much faster than we did on outside time-sharing," according to George A. Clowes, manager of marketing and planning.

The in-house equipment has made possible the development of a customer-based information system, and the company is better able to track shipments with the Burroughs system.

"But the big benefit is that with the in-house time-sharing system, everybody is looking at the same data base, languages and types of available packages. Now we can exchange people who have the same skills. It's a much easier thing to manage, and we really view that as a benefit."

Stunoff is also pleased with equipment reliability. The dual processor has had an overall 99.3% uptime since system installation and 99.91% uptime in the last few months, he noted.

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Quiet 300 Printer Debuts, Suited for Office Areas

TORRANCE, Calif. — A line printer recently introduced by Local Data Co. reportedly prints 300 line/min with the Ascii 63-char. set and 500 line/min with the Ascii 48-char./set.

The printer, based on a Teletype Corp. Model 40 print mechanism, comes in two versions: an 80-column unit that costs $3,925 and a 132-column unit that costs $4,595.

Six-part forms, from 4.5 in. to 18 in. wide and 6 in. to 22 in. deep, can be used on the printer, which has a 2-channel vertical forms unit. The 80-column version offers either friction or tractor feed, while the 132-column version only offers tractor feed.

Both units feature a buffered-serial interface with a maximum of 4K char. of memory. An "x-on, x-off" option allows a host to feed data faster than the unit can print it, storing the excess until it can be handled.

Quiet Operation

The printer is especially suited for office environments, a spokesman said. The sound level is reportedly less than 55 dba.

The Quiet 300 printer is available from Local Data at Suite 214, 2741 Toledo St., Torrance, Calif. 90503.

Air Filtration Systems 'Purify' Computer Rooms

GREENVILLE, S.C. — Batson Machinery, Inc. recently introduced a line of air filtration systems that reportedly reduce hardware malfunction problems caused by dust, dirt and pollution.

The Batson-Alpaire systems can filter from 150 to 3,000 cubic ft of air per minute and were designed to handle mechanical, chemical and germicidal filtration requirements, according to a Batson spokesman.

All models come with a standard filter for screening out large particles; filters can be added to reduce up to 95% of particles as small as .3 microns.

Five series of systems are available in models tailored to each customer's filtration requirements, the spokesman said.

Prices range from $150 to $3,000 and are figured at $1 per cubic ft of air filtered each minute by a given system. The 1300 model, for example, filters 1,300 cubic ft of air per minute and costs $1,300, the spokesman said.

The models are available in 110-, 220- and 440-volt configurations and can be installed on any firm base or suspended from the ceiling.

Batson can be reached at P.O. Box 3978, Greenville, S.C. 29608.

Device Produces Flowcharts For Blind Programmers

SAN ANTONIO, Texas — Blind or visually handicapped programmers can produce program flowcharts with raised lines and characters with a device recently introduced by Traylor Enterprises here.

The Sensory Quill is an instrument that produces raised-line drawings and writing on a thermoplastic sheet or thin aluminum foil.

Two Models Offered

Available in personal and institutional models, the device permits graphic communication between blind programmers and sighted persons, a spokesman claimed.

Both models of the device use an 11 in.-by-11.5 in. surface to contain the material drawn by a blind person.

The result is material that can be read visually or felt, which makes available to visually handicapped persons many concepts formerly difficult to communicate, the company claimed.

The institutional and personal models cost $795 and $425 respectively, from the company at Suite 210, 830 N.E. Loop 410, San Antonio, Texas 78209.

Unit Distributes AC Power

LOS ANGELES — "The Powermobile," recently introduced by Data Processing Power, is a self-contained, movable system that uses flexible shielded cables to distribute power to computer components. Use of the cables, rather than the traditional rigid conduit, reportedly eliminates the expensive, time-consuming electrical work usually required for computer room expansion, installation or relocation.

The device, available in sizes from 15KVA to 200 KVA, was said to install in less than four hours. Input power can be 208, 240 or 480 volts, all in 60 Hz, three phase; while outputs are 60 Hz, 120 or 208Vac.

Incorporating an electrostatically shielded isolation transformer, the unit provides a single-point grounding system said to eliminate troublesome ground-loop current.

The Powermobile meets the standards of the National Electrical Code and the Occupational Safety and Health Act and is approved by Underwriters Laboratories, according to a spokesman. Prices for the device range from $7,000 for the smallest unit in the series to $15,000 for a 125 KVA unit, a spokesman said from the firm at 12638 Beatrice St., Los Angeles, Calif. 90066.

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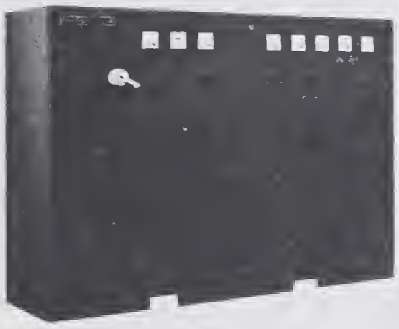

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NETWORKS NOW.

Bell & Howell Reader Debuts

HARTFORD, Wis. — An addition to Bell & Howell Co.'s 900 Series of microfiche readers, providing magnifications ranging from 18 times to 66 times via drop-in lenses, was designed particularly for eyeglass wearers, the firm said.

The Model 955 features an 11 in. by 11 in. screen, a front-access power drawer, direct projection, fanless operation and a bulb with a life of 2,800 hours.

The reader sells for $219 from the Micro Division of Bell & Howell at 857 W. State St., Hartford, Wis. 53027.

Ramtek CRT Suited for Group Meetings, Functions With Color Graphics Systems

SUNNYVALE, Calif. — A large-screen CRT recently introduced by Ramtek Corp. for use with its color graphics systems reportedly provides the ability to display information in a large-scale format suited for viewing by large groups at meetings, conferences and presentations.

The Ramtek GM-301 consists of a receiver/projector console with a screen 7 feet across diagonally, and can be attached directly to Ramtek terminals. The unit can accept direct digital television sources as well as monochrome composite video outputs from computer terminals with special video outputs, according to a spokesman.

Features of the system in direct digital television or data mode include selective underscan, alternate horizontal scan rate, synchronous level control and back-porch or Sync-Tip clamping.

Changing the Picture Size

Options available on the unit include a facility for enlarging the projected image to 10 feet or reducing it to five feet across diagonally. In general, a completely dark room is not necessary, since the picture is reportedly brighter than the intensity specified for a commercial movie theatre. As in all projection systems, however, the brightness of the image varies inversely with picture size.

Ramtek GM-301

The unit costs $8,200 and is a version of Advent Corp.'s Video Beam Model 1100. Ramtek will become the industrial dealer for the Advent product, with rights to sell and service the system throughout the U.S.

Ramtek is at 585 N. Marÿ Ave., Sunnyvale, Calif. 94086.

Running at 600 Line/Min

DPC Unveils Two Printers

MALDEN, Mass. — Data Printer Corp. (DPC) has added two different types of 600 line/min. printers to its line of OEM units. The products include a geared-down version of a 1,200 line/min. printer and an addition to the company's band-type units.

The Chaintrain 1260 — the "geared-down" unit — is a reduced-speed version of a printer recently introduced by the company. Designed for continuous use, the printer features 132-position print lines spaced at 10 char./in. and 6 line/in. with a paper slew rate of 20 in./sec.

The Band Line Model 3600 also prints a 132-char. line at the same densities. Like the Chaintrain unit, it comes with a standard 64-character set, and users can purchase 48-, 96- or 128-char. sets as options.

The Chaintrain unit costs $7,600 in representative OEM quantities; the other unit, in similar quantities is $4,600. DPC is at 99 Middlesex St., Malden, Mass. 02148.

Centronics Adds To Printer Line

HUDSON, N.H. — Centronics Data Computer Corp. has brought the number of its Centronics 700 series printers to an even dozen with the introduction of a dot matrix printer that prints characters 9 dots high by up to 18 dots wide and runs at 150 char./sec.

By using a maximum of 18 horizontal dot positions per character instead of the customary nine, Model 753 can form more readable characters, according to a spokesman.

Centronics 753

The unit, which has a paper slew rate of 15 in./sec, is available in four models, with prices ranging from $2,895 to $3,195.

Other standard features available on the 753 include 132-char. columns, bi-directional/logic-seeking printing operations, downstream loading of vertical format commands, tractor paper feed, paper-out indicator and single-line feed switch. In addition, each model has a self-contained test print capability, the spokesman noted from Centronics at One Wall St., Hudson, N.H. 03051.

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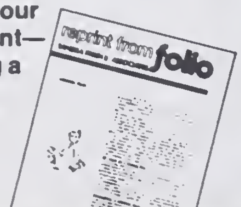

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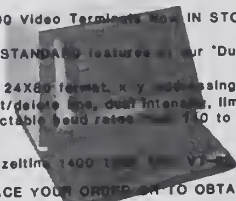

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To Handle 200 Terminals

Firm 'Calls On' Plug-Compatible Processor

By Jay Woodruff
CW Staff

ROCHESTER, N.Y. — When the country's largest independent telephone operating company found itself running out of computer power, it took an independent approach and moved to a larger plug-compatible mainframe.

Two hundred on-line terminals and nearly 90,000 daily transactions had simply overloaded the Rochester Telephone Corp.'s 1.5M-byte IBM 370/155, according to Al Cohen, district manager of computer operations.

With such a heavy daytime load, the telephone company was forced to run most of its batch processing — 320,000 accounts — at night.

Getting More Sleep

The installation of an 8-channel Itel Corp. AS/6 processor with 6M bytes of memory turned out to be part of the solution to the problem, according to Cohen. Now even processing problems don't keep the DP staff up too late.

"Last night we ran into some processing difficulties, but the system was still ready to go on-line by 3:30 in the morning — a little academic, since on-line personnel don't wake up that early," Cohen said.

The AS/6 shares data with an IBM 370/145, which has been retained because it handles a great deal of 1410 program emulation work that cannot be run on the newer system, he said.

The CPUs share 16 spindles of IBM 3350 and eight spindles of 3330 disk drives as well as IBM and Storage Technology Corp. tape systems.

Communication to the dozen IBM 3275 remote terminals located in the outlying suburban areas served by the company is handled by an IBM 3705 communications controller, while the 200 IBM 3277 terminals are located at the DP center or across the street in another company building, Cohen indicated.

Eight IBM-compatible Memorex Corp. terminals are also plug-compatible with a 3277 controller, he added.

The AS/6 was installed last July and provides a fourfold increase in computing power, which Cohen called a fairly sizable increase in capability. "The increased CPU cycle speed was by far a bigger factor than memory capacity."

The CPU allows the center to "back some of our nighttime processing work into the daytime. It allows us to take a closer look at our schedules and do rescheduling and reruns, which the previous system never permitted because of its size," Cohen stated.

What caused the move to Itel after a long relationship with IBM systems? Like many others who placed first day orders for the IBM 30 series, the nearest delivery date for a 3032 was in mid-1980, and Rochester Telephone could not afford to wait that long when it was running out of time in 1978.

By the time the telephone company began casting about for alternatives, Amdahl Corp. and Itel, neither which had competitive machinery available when the 3032 was ordered, had introduced machines that appeared to fit the company's needs, according to Cohen.

"For four months we evaluated an Amdahl 470V/5 and the AS/6. Our concerns were not with benchmarking the machines. We run a lean staff, and we were not about to run a comprehensive benchmark that would tell us nothing more, in our opinion, other than that the vendors' promotional literature is pretty accurate."

Instead, the company contacted users of IBM, Amdahl and Itel machines and found that "in every case, the machines ran as advertised."

Cohen asked for bid proposals from the three vendors, including IBM, because "we wanted to give them a chance to come up with an alternative."

IBM offered an interim model, but the telephone company had to reject the proposal because of its high cost and because it wanted to make only one CPU change instead of the two required with an interim machine.

Tipping the Scales

The scales tipped in favor of the Itel processor. After visiting Itel and Amdahl plants in California, the telephone company felt Itel "would be able to serve our requirements better than Amdahl. And since the IBM could not be delivered, we went with the Itel processor," Cohen said.

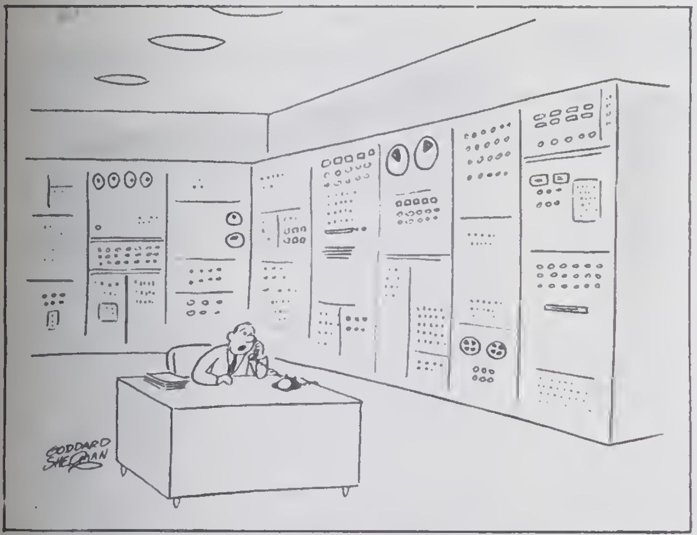
He added that price differential were not an important factor in the selection process. It was more important to make certain that adequate service could be obtained.

Preventive maintenance is performed twice a month. To date, the only two hardware problems that have surfaced have been with a circuit board that failed a diagnostic test and a loose circuit breaker connection that resulted in a burned power cable, Cohen said.

Both problems were fixed "in a reasonably short time" by an in-house Itel technician. Parts and serviceability have not been a source of complaint.

The shop will continue to run IBM's MVT until it acquires an IBM MVS system. In the future, the manager also would like to run the AS/6 and the 145 in a "shared spool environment" so all jobs would be input to the AS/6, while those appropriate to the 145 would be automatically routed to that machine.

Until the 145 is phased out, systems programmers can use it for software development when it is not performing program emulations, Cohen said.



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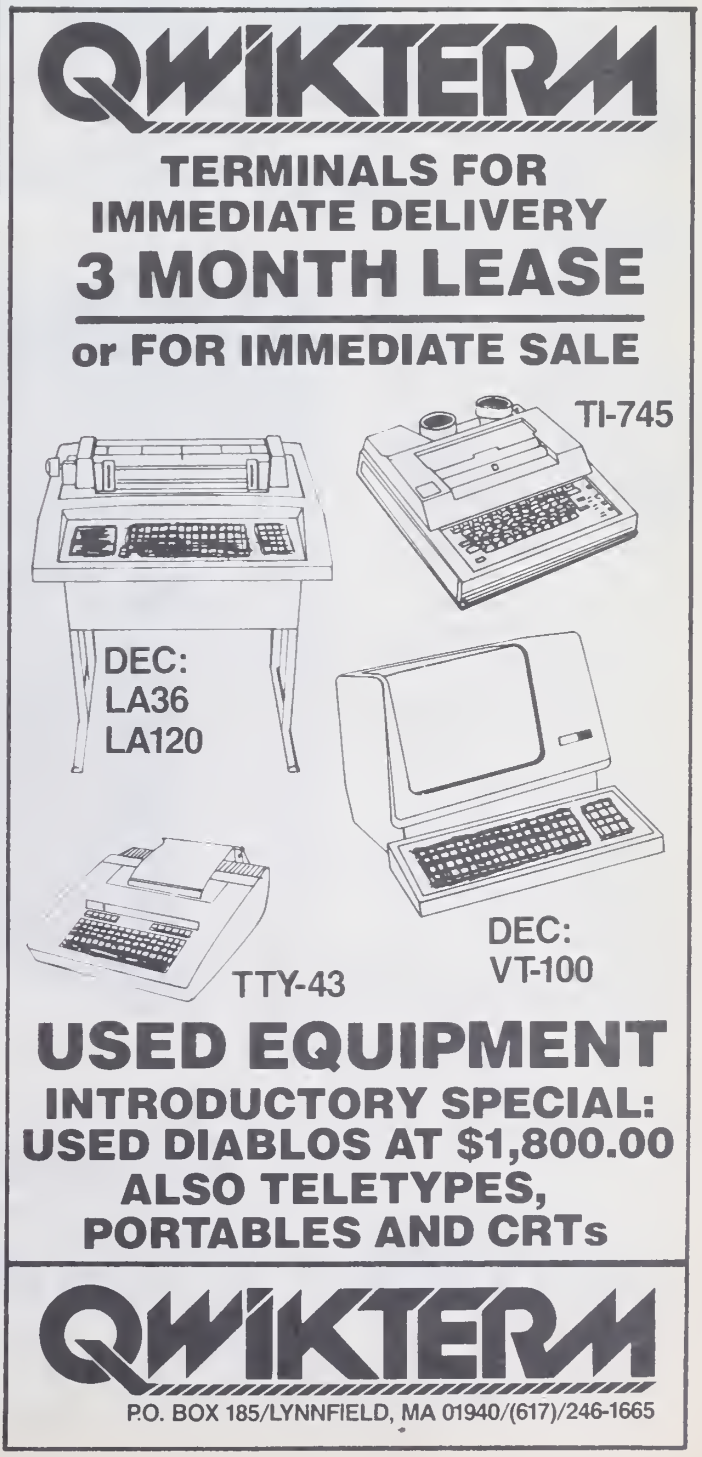
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Color Graphics: Can You Do Without Them?

By J. McQuain
Special to CW

Users of graphics terminals have felt for years that many of their applications could be improved if screen displays were in color. Until recently, however, users investigating the availability of color graphics hardware found little from which to choose.

More recently, terminals with the ability to display graphics in many colors and with reasonable resolution (640 by 480 picture elements, or pixels) have become available for less than $10,000. Even less expensive systems are available if the user can accommodate lower performance — fewer colors and resolution in the 200 by 200 pixel category.

The technological trends that are making these reductions possible are well known to the computer industry: the falling cost of memory and low-cost color TV displays. This can be appreciated when one considers that the memory requirements for displaying eight colors are three times those of a comparable monochrome system and increase as the square of the resolution.

Memory costs for color will always be higher than monochrome, but further declines will continue to lower the overall cost of color and bring it into the justification range of an increasing number of users.

Another factor that advances the availability of all graphics terminals at reasonable prices is the price decline and the performance increase of microprocessor chips. The benefits of lower cost are evident, but the increases in performance capability are of perhaps even greater impact.

A color system is significantly more complex in its control. The increase in performance of microprocessors will allow the designer to handle these complexities much more efficiently than they were handled in the past.

Reasons for Using Color

The range of applications that can be improved through the use of color is as diverse as the ,range of applications that can benefit from graphics. Color, in truth, adds a new dimension to the computer display of information.

There are four major reasons for desiring color in a graphics display:

- *To provide a coding mechanism for separating information.* In the analysis of heat distribution on the surface of a reentry vehicle, for example, the temperature of the surface can be coded from hot-hot (white) to hot (yellow) to warm (red) to cool (green) to cold (blue).
- *To emphasize important information to draw an operator's attention.* An example of this is the display of a piping diagram in a nuclear power control center; closed valves would be shown in red for immediate identification.
- *To enhance human pattern recognition.* An example is the display of a metropolitan area map overlaid with blocks coded in varying color patterns depending on the frequency of major crimes in the area.
- *To add appeal and naturalness to the data presented.* This would be evident in bar graphs depicting sales territories under quota in red and territories on target or over quota in green.

With imagination, many examples can be added to this list.

Where will the future take us? Further price decreases and performance increases will bring color graphics into the reach of more and more applications. The decreasing hardware costs, coupled with the development of software support packages that take advantage of the benefits of color, will continue.

McQuain is manager of market and competitive analysis for Tektronix, Inc. in Beaverton, Ore.

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■ Voltage Interrupt Protection—the STOR/3000 Power System will operate during an AC input power interruption of up to 60 milliseconds.

And when you consider add-on memories, look beyond the product to the company behind it. That company should be a manufacturer of memories, not just a distributor. It should be preoccupied with the memory business, bringing single-minded dedication to better memory design, development, packaging and support. It should have a powerful track record of success with previously installed memories. And its customer list should be large and enthusiastic.

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San Francisco (415) 692-4806; Toronto (416) [illegible]; Washington, D.C. (703) 683-5323.

Data Entry Use Topic of Forum

SANTA ANA, Calif. — *Data Entry Digest*, a publication dedicated to information on the data entry field, will hold seminars on managing and controlling data entry operations in New York and Washington, D.C., the publication announced recently.

Users who don't learn something useful will get their money back, the show's sponsor said.

The two-day seminars, to be held in New York June 6-7 and in Washington, D.C., May 7-8, will cover the following topics: "The Data Entry Supervisor — Yesterday, Today and Tomorrow"; "Organizing The Data Entry Department for Maximum Effectiveness"; "Identifying and Keeping Successful Operators"; "Controlling and Defining Costs"; "Reporting Operator and Department Productivity"; "How to Save Money in the Data Entry Room"; and "How to Determine if Users are Getting What They Expect."

Schedule Conflict

The seminars will cost $375 each. Registrants should make their own hotel reservations, and the publication cautioned that registrants for the New York seminar should make reservations early, since that session runs concurrently with NCC.

One of the leaders of the seminar will be Ed Feist, author of *Basic Principles of Data Entry Management* and one of the most active people in the data entry field.

Further information is available from *Data Entry Digest* at 10522 Ridgeway Drive, Santa Ana, Calif. 92705.

DP: Shot-In-The-Arm

Minis Called Boon for Rural Medics

Minicomputer technology allows physicians to carry more than their black bags into remote communities. Rural health specialists can bring access to CPUs located close to their patients, providing faster information retrieval to support treatments than was previously possible.

By Keith A. Jones
Special to CW

The problems of rural areas differ from those of urban areas in many ways. Similarly, the needs of rural medicine are different in degree as well as kind. Although modern rural medicine needs DP and other technological support, rural areas cannot easily afford the expense or meet the energy or technology requirements of large-scale DP systems.

Whereas major DP facilities are out of the question in most rural communities, minicomputers are a viable alternative. Minis have already been used in a number of configurations in rural areas, and many more configurations and applications are currently under consideration.

Adopted With Success

Minis have already been used with great success as part of the health care delivery systems of several isolated rural areas. Among the most impressive are the systems adopted by the Indian Health Service (IHS) and by the University of Utah's Department of Medical Biophysics and Computing.

The IHS uses minis in Sells, Ariz., as part of a complex configuration. Paraprofessionals in mobile health units and local health centers are remotely linked by microwave and by modem to the Sells Hospital, which is in turn linked with major DP centers in San Xavier and Tucson.

Many configurations have been tried, and the present arrangement is based upon input by trained clerks and direct remote linkage. According to Dr. Alfred Garret, IHS systems management director, the present configuration is 99% accurate. More use will probably be made of stand-alone minis, however, as soon as health care providers become secure with DP procedures; more technical manpower support is available to rural areas; and software is developed appropriate to the special health care needs of such areas.

Serving Rural Utah

In rural Utah, communities with critical health manpower shortages are served by paraprofessionals with stand-alone and modem-linked Data General Corp. Nova systems.

"One of the advantages of this computer is that it makes it exciting and attractive for prospective health care providers going to the area," according to Dr. Reed Gardner of the Latter Day Saints Hospital in Salt Lake City. "Also, there is the ability to audit and

(Continued on Page 78)

Datapoint Unveils Disk System For T/S, Attached Processors

SAN ANTONIO, Texas — Datapoint Corp. has announced a 180M-byte disk storage subsystem available as part of its Datashare time-sharing system or its Model 4654 Attached Resource Computer (ARC) File Processor.

Two 60M-byte drives in a single cabinet, designated the 9390, and a 60M-byte extension drive, called the 9391, comprise the subsystem Datapoint is selling as Model 9390/9391. The 120M-byte 9390 is sold separately.

Datapoint 9390 Disk Subsystem

"A maximum capacity [9390/9391] provides as much storage in its two cabinets as conventional [Datapoint] multiplatter 2314-type mass storage disk drives do in seven," the vendor declared. A 9390 cabinet stands 36.2 in. high, 36 in. deep and 22 in. wide.

The subsystem employs Datapoint's 9760/9762 Storage Module Drive (SMD). Each drive uses removable, top-loading SMD disk packs consisting of six recording surfaces — five for data and one for servo information. The disk packs are reportedly lighter and smaller than conventional multiplatter mass storage packs.

Dynamic braking brings a drive to a halt in about 25 sec., while approximately 15 sec. elapse from the time a pack is changed to the time the drive is again on-line, Datapoint stated.

Operator controls consist of start and protect switch-indicators and ready and fault indicators mounted on each drive, the vendor continued. A console that mounts on the Datapoint processor contains the controller for all drives.

The 9390/9391 controller contains a large number of buffer pages for data storage, Datapoint continued. Data transfers between the controller buffer and the proc-

(Continued on Page 76)

Minis Underwrite Speed of DP For Mortgage Insurance Firm

Special to CW

LOS ANGELES — Quick turnaround time, accuracy and dependable communications are the lifeblood of an insurance company, particularly when its offices are scattered throughout the U.S.

The Ticor Mortgage Insurance Co., headquartered here, participates in the private mortgage insurance market and recently put together an extensive dispersed DP network to facilitate customer service and in-house communications.

The network is based upon Datapoint Corp. computer systems and has not only improved the accuracy of data entry and forms production tasks involved in both the underwriting and cash control programs, but has also improved management/branch interaction between the firm's main office and 18 satellite sites, according to Fred Willis, Ticor's director of systems and DP.

As a private mortgage insurer, Ticor handles high loan-to-value mortgages — home loans with less than 20% down payment — made by lending institutions. With private mortgage insurance protection, the lender can grant a conventional home loan requiring as little as a 5% down payment.

Before installation of its present system, Ticor used a manual data input system in its branch offices which worked in conjunction with a CPU and service bureau in Los Angeles. Because a significant portion of the underwriting process was purely manual, the procedure was exceptionally time-consuming and prone to error.

For example, the data input process involved manual coding of the input document, batching it with others, sending it by mail to Los Angeles, answering questions from Los Angeles over the phone and typing

(Continued on Page 74)

Univac Announces Three Printers For V77 Family

IRVINE, Calif. — Univac Minicomputer Operations (MCO) has announced three character printers for its V77 family of minicomputers.

They are the Model 0786-77 bidirectional printer and controller; the Model 0786-74 bidirectional printer and controller; and the Model 0786-59 unidirectional slave printer.

The 0786-77 is a receive-only 7 by 7 dot matrix printer that runs at up to 200 char./sec with the full line buffers, 132 print positions and 6-line/in., MCO stated. Throughput is 144 line/min at 50 char./line and 75 line/min at 132 char./line.

The 0786-74 is a receive-only 7 by 7 dot matrix printer that can perform at 200 char./sec with a full-line prebuffer, 132 print positions and 6 line/in., MCO continued. Its throughput is 75 line/min at 50 char./line and 37 line/min at 132 char./line.

The 0786-59 is the same as the 0786-74 without the controller, MCO said. This printer serves as a slave unit with Univac's Model 70-6483 CRT terminal, a buffered asynchronous display with parallel printer interface.

Character set selections for the three printers include 64-char. Ascii and 96-char. sets for use in Europe.

The 0786-77, 0786-74 and 0786-59 cost $5,750, $4,500 and $4,250, respectively MCO is at 2722 Michelson Drive, Irvine, Calif. 92664.

Minis Underwrite Speed of DP for Insurers

(Continued from Page 73)

the insurance commitment. Computation errors were, in many cases, not found until the document was transferred to the central computer system about once each week.

In addition, this approach was costing Ticor more than $25,000 a month.

"It seemed as if our DP cost was increasing faster than our premium volume," Willis said. "Dispersed processing is not only speeding up our underwriting program, but by purchasing the equipment, we expect to achieve a significant return on our investment within 18 months."

Presently, Ticor's branch offices are using either Datapoint 1170 dispersed processors or 5500 advanced business processors, both running under Datashare Business Time-sharing, in their underwriting program to handle local DP. Data from the branch offices is communicated over telephone lines to a Datapoint 4520 in the home office.

With this dispersed processing and communications system, each underwriting office is able to provide same-day turnaround on commitments for mortgage insurance with the assurance that these commitments meet the guidelines established by the home office, Willis said.

Ticor incorporated a variety of underwriting verification checks, formerly performed by the home office, into a program that will run on the Datapoint systems in each branch office.

Steps Consolidated

Using the Datapoint systems, the data entry, processing and printing of a commitment are accomplished in one action, which normally takes less than three minutes to complete, Willis stated. Data on each policy is entered either on a Datapoint 3601 CRT workstation supported by a 5500-based 4520 system, or an 1170 dispersed processor located in the branch offices.

This data is checked by software edits written to fit the underwriting guidelines of the home office, after which a final verification of calculations is made by the equipment. A final commitment of insurance is then printed out on a Datapoint 80 char./-sec Freedom printer.

The commitment can then be handed to the policyholder directly or mailed so it will be received by the next day. The premiums and policy data are stored on diskettes or cartridge disks for transmission to the home office at the end of the day.

Cash Control Program

Ticor uses the Datapoint systems not only for underwriting checks, but for a cash control program as well.

"Previously, our financial planning department was unable to readily identify how much cash was available to invest at any given moment," Willis explained. "Now, at the end of each day, Ticor knows exactly how much cash has been received and paid throughout the branch network."

As each branch receives the premiums, it posts them on a 3601 workstation. The amount is stored in memory for preparing a bank deposit slip and branch cash report later that day. After the deposit is delivered to the bank, the branch office calls the amount into a central electronic funds transfer (EFT) system.

Via EFT, the deposit is transferred to a concentrator bank which, in turn, transfers it to an account maintained in Ticor's home office. After it receives the EFT transaction report, the home office can verify it with the cash report it received the night before from the branch offices.

The Ticor network of Datapoint 4520 and 1174 systems ties into a 4520 maintained at the home office. This transaction-oriented system incorporates a Datapoint 5500, 80 char./sec Freedom printer, 5M-byte cartridge disk, reel-to-reel magnetic tape unit, communications interface, Datashare time-sharing software and can support up to 16 Model 3601 CRT workstations.

The smaller 1174 systems are based on the 1170 dispersed processor with a four-diskette storage unit, an attached 80 char./sec printer and a communications interface.

Home Office Operation

The home office system creates a daily transaction file on its magnetic tape unit, which is then transferred to an IBM 370/158 with a resident premium-commission software application package.

The large computer does the necessary numbercrunching and file management. All communications with the branches is handled by the Datapoint system using Datapoll communications software.

Ticor concluded that it was less expensive to buy the Datashare system for home office/branch communications than to write communications software on the mainframe, according to Willis.

Every workday night, the unattended home office 4520 system polls each of the branch offices to obtain data on policy and cash transactions conducted during the day. Although all the branch offices are closed, Datapoint's Datapoll program, which was activated by the branch personnel before they left the office, automatically responds.

"The system is very easy for branch personnel to learn," Willis pointed out. "Menus with selection of commands lead the operator through the transaction to be performed."

When Ticor decided to change its method of processing, it considered a variety of approaches: remote job entry (RJE) with a large CPU, intelligent terminals tying to a large central computer and the dispersed processing approach.

"RJE terminals or intelligent terminals tied to a central computer would have slowed down the underwriting process," Willis said. "Each branch would have had to wait its turn, and thus delay the process."

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Has Bit-Slice Processor

Mini Offers Programmer Throughput Control

OAKLAND, Calif. — A multitasking 16-bit minicomputer offering programmer control of system throughput is available from Digital Microsystems (DM).

The Hex-29 mini allows 16- or 32-bit integer and 64-bit floating-point operations, a DM spokesman said. The bipolar bit-slice processor offers a machine cycle time of 160 nsec, with many instructions running in two machine cycles.

All versions of the Hex-29 come with Host, a multiuser time-share operating system, and extended Basic-Plus. The basic system can be expanded to include 1M byte of main memory, 32 terminal ports, 4.8 billion bytes of disk storage and a wide range of printers and terminals, DM stated.

The entry-level version features the CPU card; "Exec" card, with Host support and eight RS-232 asynchronous communications ports; 94K bytes of memory; 512K bytes of floppy disk storage; 64-bit floating point and 32-bit integer arithmetic units; and cabinet with power supply, fan and 8-slot motherboard.

DM described a "small hard-disk system" as including 288K bytes of main memory; 32M bytes of disk storage, fixed and removable; either terminal ports; one CRT terminal; one 300 line/min. printer; and Host, extended Basic-Plus, text editor and macro-assembler. That configuration was tagged at $34,995.

For $55,455, a "typical large" configuration would include 542K bytes of main memory; 192M bytes of disk storage; 24 terminal ports; one CRT terminal; one 300 line/min printer; and the previous system's software.

OEM and quantity discounts are available from DM at 4448 Piedmont Ave., Oakland, Calif. 94611.

D100 Drives Extended For OEMs

PARIS — CII-Honeywell-Bull has extended its D100 family of disk drives for OEMs.

The D160 drive comes in three versions with two, three or four nonremovable platters and packs up to 120M bytes into a volume one-third the size of conventional drives, the vendor claimed.

Each version measures 5.6 in. by 12.2 in. by 21.8 in., and three D160s can reportedly be mounted vertically in a standard 19-in. rack.

Mixing Allowed

All members of the D100 series are compatible and can be intermixed on the same controller, the French affiliate of Honeywell, Inc. said. One or more D160s may be associated with the vendor's D120 drive to provide a "high-throughput" 10M-byte load dump for the fixed-disk data base.

The three versions of the D160 provide 60M bytes on two, 90M bytes on three or 120M bytes of four nonremovable platters with four, six or eight low-pressure heads contained in a sealed module.

Head positioning on the D160 occurs by reading servodata interlaced in each track so that heads automatically position themselves on the required track, Honeywell Bull continued.

Recent Releases

The D160 announcement follows recent releases of the 10M-byte D120 cartridge drive and the D140 drive, which holds 20M bytes on one fixed and one removable platter. Those drives employ the vendor's 11-in. square M4120 cartridge.

OEM quantity prices for the D160 are $3,085, $3,355 and $3,625 for 60M, 90M and 120M bytes, respectively. Deliveries are slated for early next year.

More information on these products is available from Jean-Paul Garodel, Bull Corp. of America, M/S 430, 200 Smith St., Waltham, Mass. 02154.

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Small Business System From BPS Costs $12,000

NEW YORK — A $12,000 small business system, including hardware and software, has been announced by Better Programming Systems, Inc. (BPS).

Based on the BPS data management system, the unit offers optional payroll, general ledger and word processing packages to provide for such applications as report writer, data update and data query, a spokesman said.

Standard equipment includes a 1M-byte mass storage CRT with full-sized keyboard and a 125 line/min upper and lower case printer.

The BPS runs on an Ohio Scientific, Inc., Challenger II or III microcomputer and is written in Basic.

BPS is at 322 W. 57th St., New York, N.Y. 10019.

HP-Compatible Tape Systems Debut

SAN DIEGO — A family of 1/2-in. magnetic tape systems plug-compatible with Hewlett-Packard Co. systems is available from Dylon Corp.

The Dylon Series 2000/9000 tape systems are electrically, physically and logically compatible with HP's 9800, 250 and 300 systems, according to a spokesman.

A dedicated microprocessor allows the IBM- and Ansi-compatible tape system to join HP's I/O interface for batch processing, programmed information distribution, archival and data interchange applications.

The intelligent controller runs user-programmed routines and provides free formatting and error detection with automatic correction, he added.

A system that includes a 10-1/2-in., 9-track tape drive with 1,600-byte/in. density; controller; buffers; formatter and 54-in. rack enclosure costs $9,875. Compatible slave subsystems cost $5,350 with cabinet and daisy-chain cable.

OEM and quantity discounts are available, and deliveries are promised within 90 to 120 days of order.

Dylon is at 3670 Ruffin Road, San Diego, Calif. 92123.

Tape Controller Fits DEC Micros

HOUSTON — A paper tape controller said to be completely hardware and software compatible with all models of Digital Equipment Corp.'s LSI-11 and PDP-11/03 has been introduced by Computer Extension Systems, Inc. (CES).

Address selection of the PTC-L11 contoller is made through a 10-position dual in-line package (DIP) switch, while vector address is selected using a 5-position DIP switch.

With a one-year warranty, a single unit costs $600 from CES, 17511 El Camino Real, Houston, Texas 77058.

Processors Get Disk Subsystem

(Continued from Page 73)

essor can reportedly be done at any time, even if the controller and disk are busy.

The Datapoint 4650 Datashare system, consisting of a Datapoint 6600 Advanced Business Processor with the 9390/9391 subsystem, costs $56,000; two year leases go for $1,725/mo.

The Datapoint 4654 ARC File Processor, consisting of a 6600 processor with ARC software and the 9390/9391 subsystem, also costs $56,000 or can be leased for two years at $1,725/mo.

Maintenance for those two configurations costs $550/mo. Datapoint added. The 9390 stand-alone drive and controller can be purchased as an upgrade to existing Datashare systems for $42,950 or leased for two years at $1,320/mo. Maintenance for that configuration costs $275/mo.

Datapoint is at 9725 Datapoint Drive, San Antonio, Texas 78284.

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Suits Remote Processing

'Factmatcher' Edits, Manages, Queries Data

ELMSFORD, N.Y. — A minicomputer-based text file management system that reportedly incorporates data base management functions, information retrieval and text-editing capabilities is available from Mini-Computer Systems, Inc. (MCS).

Factmatcher features information retrieval from a structured or unstructured data base, a query language and a word processing system.

The system is available with 64K to 256K bytes of memory and up to 10 key/display stations. On-line data storage varies from 10 million to 268 million characters.

Factmatcher is said to communicate with other vendors' equipment by means of a bisynchronous interface at rates of 2,400-to 9,600 bit/sec. With a typical 4,800-bit/sec line, the spokesman said, 1,000 pages of text can be transmitted in an hour.

The Factmatcher character printer has 10- and 12-pitch proportional spacing and bidirectional printing under user control, with a speed of 55 char./sec at 12 char./in. Multiple type fonts are available.

For applications requiring lower quality printing, a 300-line/min printer will print a standard stationary page in four to eight seconds, the spokesman said.

The system's key/display stations have eight hard-coded function keys and a pad cluster of nine user-assignable numeric keys. Word processing features include fixed format or free text entry, auto pagination, auto input underline, vertical scrolling, page scrolling and display highlighting.

Prices vary according to configuration. A typical Factmatcher system consisting of CPU, MCS' Micos operating system, 128K bytes of memory, five key/display stations, three 67M-byte disk drives, one 1,600-bit/in. tape unit, one 300-line/min printer, one 55-char./sec printer, associated controllers and cables and Factmatcher software costs less than $160,000.

Maintenance is provided throughout the U.S. and Europe by MCS from 399 Fairview Park Drive, Elmsford, N.Y. 10523.

Report Rates IBM WP

CHERRY HILL, N.J. — An in-depth evaluation of IBM's Office System 6 word processing (WP) system is available from Management Information Corp. as one of a series of such analyses.

In addition to complete descriptions of the systems' hardware, software and pricing, the articles, appearing in the monthly *Officemation Reports,* present capsule reports on both the good qualitites and bad points of the systems.

The report on the IBM Office System 6 is available for $10 — $15 outside the U.S. and Canada. A one-year subscription to *Officemation Reports,* which consists of 12 evaluations of word processing systems, costs $85 — $110 outside the U.S. and Canada, including air mail.

Management Information is at 140 Barclay Center, Cherry Hill, N.J. 08034.

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Rolm Adapts DG Eclipse CPUs for the Military

SANTA CLARA, Calif. — A line of militarized versions of Data General Corp. Eclipse CPUs has begun with a system offering high-speed cache, floating point hardware and a maximum main memory of 1M bytes.

Rolm Corp.'s MSE/30 kicks off its projected "Mil-Spec Eclipse" family. Aimed at the military, the systems are intended for command, control and communication data base management and logistics applications. Under DG's Advanced Operating System (AOS), the MSE/30 accepts DG's Infos data base management system, Cobo, global-optimizing Fortran V, PL/I and the Algol-like DG/L, a spokesman said.

The MSE/30 features a microprogrammed CPU supported by the Eclipse commercial instruction set. Capabilities include word-, byte- and bit-addressing, string-handling and field-editing, the spokesman continued. Main memory ranges from 256K to 1M bytes, while on-line disk storage is available in 67M- to 545M-byte capacities.

Shared Processor Configurations

Rolm's Multiprocessor Communications Adapter (MCA) comes with the MSE/30 to allow shared processor configurations. Moreover, Rolm's I/O Processor (IOP) purportedly accelerates character I/O processing, while an Extended Arithmetic Processor (EAP) functions in parallel with the CPU for all floating-point operations.

"The Mil-Spec Eclipse family marks a significant advance in Rolm's ability to meet severe-environment applications that require a large main memory with a very large amount of on-line disk storage," the spokesman declared.

With AOS and 256K-byte main memory, the MSE/30 costs from $150,000 to $200,000, depending on the peripherals selected, he added.

Rolm is at 4900 Old Ironsides Drive, Santa Clara, Calif. 95050.

Minis Seen Critical for Rural Health Care

(Continued from Page 73)

better control the actions of paramedical personnel in these regions."

An impact study of mini usefulness to rural health care was conducted by Meridian Enterprises, Inc., a DP consulting firm. Surveys were sent to health care policy-makers, practitioners, students and rural residents to determine their receptivity to medical minis.

Public health policy-makers and rural physicians regarded medical minis as useful to rural health care delivery. Nonetheless, minis were rated as second in importance to the primary goal of increasing the number of rural physicians.

In addition, minis were seen as potentially valuable only if more reliable medical software could be provided and if the federal government would offer to accept a larger portion of the expense for implementation.

Public health workers and policy-makers gave the highest priority to mini applications such as billing, inventory and medical records — applications that were similar to DP functions in urban medical centers. Medical students also gave high priority to the support of emergency transport systems, epidemiological data collection and analysis of clinical tests.

Forty percent of the rural residents surveyed expressed the desire to have a stand-alone informational medical mini in their own homes to help them with medical self-care. Also, 74% were in favor of installing remote-linked medical minis that would be operated by public health nurses at local public schools to give around-the-clock emergency medical advice by telephone.

A social impact study of rural medical minis and their prospective influence upon rural health care was conducted by the Institute for Rural-Suburban Research and Planning. The following are several of the study's policy recommendations:

- Safer methods should be developed for protecting the confidentiality of patients whose medical records are maintained in both stand-alone minis and remote-linked systems. Also, efforts should be undertaken to assure rural residents of the reliability of such methods.
- There should be a greater emphasis upon developing more medical mini protocols and appropriate DP software for use in isolated rural areas. Such software should be more reliable and based upon natural language so that medical personnel can operate medical minis easily with a minimum of errors.
- There should be an increased emphasis upon marketing minis in rural areas. An increased use of minis could help increase the efficiency of rural businesses, and an increase in the viability of the rural economy could help alleviate many rural health care problems.
- There should be more of an emphasis upon the use of minis and computer-assisted instruction in rural education. Encouragement of the use of such equipment should similarly increase the efficiency of rural educational institutions, thus increasing the rural educational level and at the same time increasing receptivity to technology and confidence in mini-based DP.
- Medical minis should be subsidized by the federal government for all isolated rural communities and rural health care providers who need them. This could be done with the cooperation of the National Health Service and of the Rural Health Initiative (RHI).

Jones is president of Meridian Enterprises, Inc., a DP-consulting firm at 1833 Rosemond Drive, Jonesboro, Ark. 72401.

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Plessey Cuts Price On Mini Memory

IRVINE, Calif. — Plessey Peripheral Systems has slashed prices on storage devices for users of Digital Equipment Corp. PDP-11 minicomputers.

Plessey peeled $1,800 from the price of its PM-SJ11 add-on MOS memory for the PDP-11/70 supermini. The PM-SJ11 stores 256K to 1.5M bytes and includes error-correction code, error-logging register and a front panel. The memory now sells for $8,215.

Plessey took $1,225 off the price of its PM-DS11/80 mass storage device, which emulates DEC's RP11. The PM-DS11/80 features a formatted capacity of 62.4M bytes to 250M bytes per drive and is now tagged at $13,220.

The cost of the vendor's PM-DS11/300C, which emulates DEC's RJP06, also was trimmed. This mass storage unit holds 2G bytes when fully extended to eight disk drives, Plessy said. The unit now costs $21,405 — $4,580 less than before.

Savings of more than 15% are reported possible with the PM-TS11, Plessey's replacement for its TM-11/TU-10 magnetic tape systems. The PM-TS11 was said to provide a storage medium for holding and reading large volumes of serial data.

Plessey is located at 17466 Daimler, Ivrine, Calif. 92714.

Buyer Protection Plan Offered for PDP-11/23s

WESTMONT, Ill. — A buyer protection program allowing Digital Equipment Corp. PDP-11/03 purchasers to upgrade to a PDP-11/23 at the moment it is available has been announced by First Computer Corp.

The estimated delivery time for the newly announced 11/23 is about eight months to a year.

Instead of putting off buying the 11/-23 until it is available, customers may satisfy their immediate needs by buying the 11/03 now and upgrading to the desired machine as soon as it is available, a spokesman explained.

Specified Procedure

To take advantage of the offer, a buyer must pay $300 now for rights to the desired machine. First Computer will tell him when the machine will be available. The buyer must then order the unit within 30 days of the notification date.

First Computer sells the PDP-11/03 for $9,480 with 16K words of memory and for $16,265 with 32K words and a 5M byte disk.

The 11/23 board with 32K of memory costs $2,790. It also can be purchased with 64K of memory for $4,190 and with 96K of memory for $5,590.

First Computer is at Corporate Sq., 825 N. Cass Ave., Westmont, Ill. 60559.

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The BTI 5000 Interactive Computer System. An all-new system offering high storage capacity, fast response, superior operating flexibility and high reliability.

It's a multi-access system. The BTI 5000 supports up to 32 users at the same time. Because the operating system software is a true timesharing executive, users can perform any mix of independent or related tasks.

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Communication is simple. User terminals may be connected by direct cable, or over the telephone via dial-up or leased lines. Any ASCII, asynchronous, RS-232C compatible terminal can be used with the BTI 5000.

It's easy to program. BASIC-X is the BTI 5000's programming language, an extended version of BASIC continually augmented by BTI over the past 10 years. It retains BASIC's simplicity for the novice programmer, but has the features the experienced programmer needs.

Application software is available. The BTI 5000 comes with a library of contributed and factory-supported programs. Proven applications packages are also available for accounting, inventory control, order processing, text editing, mailing list management, and more, plus general-purpose data base managers.

It's easy to expand. User capacity can be increased from 8 to 32 ports. On-line storage can be expanded from 29 to over 500 megabytes. You can add multiple magnetic tape cartridge drives, industry-compatible 9-track magnetic tape, line printers from 300 to 900 lines/minute.

But it's not expensive. With 8 user ports, 29 megabytes of hard disk storage and a magnetic tape cartridge drive, the BTI 5000 costs just $38,950. A 58 megabyte system costs only $2,000 more. And if you want more than one system, the quantity discount is attractive.

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BTI, 870 W. Maude Ave., Sunnyvale, CA 94086. Sales Offices: Cherry Hill, NJ (609) 662-1122; Boston, MA (617) 843-4700; Minneapolis, MN (612) 854-1122; Chicago, IL (312) 298-1177; St. Louis, MO (314) 878-8110; Dallas, TX (214) 630-2431; Sunnyvale, CA (408) 733-1122, Anaheim, CA (714) 533-7161; United Kingdom; Slough 70044.

Papers Needed For DG Meeting

WESTBORO, Mass. — Users of Data General Corp. computer systems are invited to submit papers on their applications for the Sixth Annual Conference of the Data General Users Group.

The conference is scheduled for Dec. 4-7 at the Hyatt Regency Hotel in New Orleans. Abstracts of papers are due Sept. 1 and should represent work that can be presented orally in about 45 minutes, the users group said.

At Least An Outline

The abstracts should be about 250 words long. A copy of the formal paper or an outline should be submitted by Nov. 23, the group stated.

Abstracts will be published in the meeting program, and papers will appear in *Proceedings of the 1979 Annual Meeting*. Papers will be selected on the basis of their abstracts. Authors who are selected to participate will be notified by Oct. 15.

Additional information is available from Pat Schultz, users group director, Data General Corp. at 15 Turnpike Road, Westboro, Mass. 01581.

Plotter Interface For PDP-11 Minis

ORANGE, Calif. — A plotter interface for Digital Equipment Corp. PDP-11 minicomputers is available from MDB Systems, Inc.

The MDB-XY11 plotter interface gives "total" plotter capabilities with no change in system software, MDB claimed. It was said to be plug-compatible and transparent to PDP-11 CPUs.

The interface costs $1,250 from MDB at 1995 N. Batavia St., Orange, Calif. 92665.

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Mitre Report Indicates:

Number of Micros Growing in Libraries

By Ann Dooley
CW Staff

Microcomputers may be the solution for libraries that must decrease staff because of budget cuts, while trying to maintain quality services, a report by the Mitre Corp., a nonprofit planning organization, has found.

Some librarians realize that manual systems are labor-intensive and that one of the few ways for libraries to respond is by automating their procedures. But few librarians know how to select the best, most cost-effective system to meet their needs. The Mitre reports outlines what to look for in a micro system.

The microcomputer can be used to automate functions, solve specific problems and perform in a distributed system at low cost, *Microcomuters in Library Automation* noted. Microcomputers have not been widely accepted to date since many librarians are unfamiliar with automated equipment, the report indicated.

Most micros currently appear in the cataloging and circulation departments of libraries, but micros in the acquisition, serial, reference, administration and audiovisual departments also are becoming more common. Micros can be used in supporting roles inside light pens, optical character recognition wands, data conversion units and intelligent terminals, the report noted.

Automation Simplifies Tasks

In manually operated libraries, many librarians don't know what is actually in their collections. Overdue notices and reserves are two common problems for librarians using these manual operations.

Automated systems, on the other hand, allow librarians to gain control of their collections. Overdue notices are immediately printed, and reserve books can be spotted at the circulation desk. The amount of labor also can be reduced, freeing staff for other work, according to the report.

The basic requirements for an automated system should include automatic check out/check in of items, allowance for renewals and a reserve system with automatic notification. The system also should have the ability to identify patrons returning late items at the circulation desk and should be able to search the circulation record to see if an item has been checked out and if so, when it is due back.

In addition, the system should be able to produce overdue notices and collect and print statistics.

Computer systems provide alternatives to the card catalog and have been used mainly to replicate existing files, not to replace them. Most libraries plan to keep their card catalogs in operation at least until 1985, the report stated.

The requirements for a cataloging system include functions that would document and list a detailed record of each item in the collection and that would provide a catalog or index, which patrons could use to locate desired information about items in the collection.

Although automation in cataloging has saved time in the library, it has not changed the basic way in which cataloging is conducted. Since there is no consensus among libraries as to how catalog records should be organized, the role of micros in cataloging will be limited, the report indicated.

The library's acquisition department handles all work involved after the initial request of library materials is made and until the item again appears on the shelf for circulation.

System requirements for an acquisition function should include the ability to receive initial requests from procurement, to pre-order searching and to place orders with suppliers, determining prices and availability. Other accounting functions and business activities also should be provided.

As with cataloging, there is no consensus between the library community and the vendors about what constitutes an automated acquisition system and until all the parts are put into one system, use will be limited, the report said.

(Continued on Page 82)

TI Adds Memory Access Controller, Gives Signal for Two Channels

HOUSTON — Priced at $15.40, the TMS9911 direct memory access controller from Texas Instruments, Inc. here generates memory control signals and sequential memory addresses for two separate Direct Memory Access (DMA) channels.

The device can access memory autonomously with respect to the CPU, providing for I/O at a rate of 1 million 16-bit word/sec, according to TI.

Multiple units can be used to expand the number of DMA channels beyond two, the firm added. Both of the DMA channels have two 16-bit registers — memory address registers and last address registers.

Initial access requires that the device gain control of the system memory bus and while the device has control of the bus, no other unit or the CPU may perform memory operations.

The unit — in a 40-pin, dual-in-line package — is available from authorized TI distributors or directly from the firm at P.O. Box 1443, MS/6404, Houston, Texas 77001.

Account Packages Offered For Radio Shack's TRS-80

HOLLYWOOD, Fla. — Payroll and accounts receivable packages written for Radio Shack's TRS-80 system are available from National Software Marketing, Inc., here.

The packages were written for a DOS level II system with two disks and a printer. The payroll can handle 99 employees with monthly, semimonthly, weekly and biweekly pay periods. It also contains a master file maintenance module that permits entering new employees, changing employee data and making adjustments for normal checks.

Under the accounts receivable program there is an in-line credit check capability for 8,000 accounts, and the reports produced include a daily accounts receivable journal, a credit check position report and a master file listing.

Each package costs $55 from National Software Marketing at 4701 McKinley St., Hollywood, Fla. 33021.

DEC Cuts Micro Price

MARLBORO, Mass.— Price reductions of between 12% and 20% have been announced for Digital Equipment Corp.'s LSI-11/2 microcomputers.

Effective immediately, the reductions will bring the price of an LSI-11/2 with 64K bytes of memory from $2,490 down to $1,900, the firm noted.The unit with 32K bytes of memory is now priced at $1,490, down from $1,690, the firm added.

The unit is available with 8K, 16K, 32K or 64K bytes of memory or optionally without any memory, the firm said.

Circuit Board, Tape Decks Work With Zilog Micros

MISSISSAUGA, Ontario — The Model DS11 controller board from Sonotek Ltd. was built to link 9-track tape decks with Z80 technology and is directly compatible with Zilog, Inc. Z80-MCB series bus, ADS-1 and MCZ-1 microcomputer systems.

The controller will handle up to four tape drives. It operates on single voltage, 5/Vdc power from the microcomputer bus, and is capable of controlling most formatted tape decks.

The system uses a 25 in./sec tape deck, 800 bit/in. NRZI recording and features DMA transfers for high speed, dual gap read after write, a full IBM-Ansi compatible format with the necessary parity, redundancy check characters, gaps and file marks. The tape decks are available in three sizes and operate on 115 or 230 Vac or, optionally, on 28 Vdc power, the firm said.

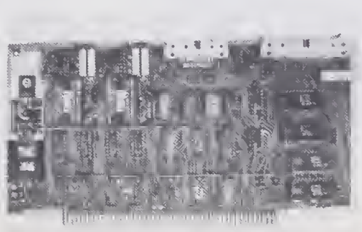
The controller costs $1,350 from Sonotek Ltd. at 2410-5 Dunwin Drive, Mississauga, Ontario, Canada L5L 1J9.

S-100 Bus Board Unveiled, For Use With Z80 Micros

NEWBURY PARK, Calif. — A series of S-100 bus-compatible devices for use with the Z80, 8080 and 8085 microprocessors has been unveiled by California Data Corp. here.

The Model DA110 board is a 2-channel, 12-bit, digital-to-analog converter that also can work with 16 bits of digital input and 16 bits of digital output. The board has 12-bit resolution and provides output to a memory scope or graphic display as well as X-Y plotters, the firm said.

The units, which cost $395, accept either binary or two's compliment input coding, The output current is 10ma, California Data said from 3475 Old Conjeo Road, Newbury Park, Calif. 91320.



The Model DA110 Board

Micro 'College' Set

DENVER — A Microcomputer Weekend College will be held in Denver on two Saturdays, May 12 and 19.

Sponsored by the University of Denver Graduate School of Librarianship, the sessions will focus on microcomputers in library automation, operational protocols and procedures, system selection and microelectronics.

A number of speakers are scheduled. In addition, leading manufacturers will display their hardware and provide information about their microcomputer systems.

Who to Contact

Cost for the two days is $85. Further information may be obtained from Dr. Anindya Bose at the Graduate School of Librarianship, University of Denver, Denver, Colo. 80208.

Micro Board Racks Announced

EL MONTE, Calif. — Kit/-Racks can be adjusted to accommodate almost any size microcomputer board, using only a screwdriver, according to its manufacturer, Birtcher Corp.

The Kit/Racks can be used by system designers or for prototype applications. They enable production design changes to be made quickly, easily and without additional expense, the firm claimed.

The racks come in side plate heights of seven in., 10 and one-half in. and 12 and one-quarter in. The side plates contain vertical slots to permit guide plates and connector rails to be adjusted.

The racks fit all standard 19-inch chassis and accommodate all boards from two in. to nine in. deep and two in. to 11 in. high.

Each kit costs $49 from Birtcher Corp., Industrial Division, 4501 N. Arden Drive, El Monte, Calif. 91734.

Apple II Gets Calendar/Clock

SANTA CRUZ, Calif. — Mountain Hardware, Inc. is now offering a Real-Time Calendar/Clock to users of Apple Computer, Inc.'s Apple II computers.

The Apple Clock keeps the time and date in one usec increments continuously for more than a year. The calendar, clock and event timer functions are accessed from Basic, using routines carried in on-board read-only memory (ROM).

This clock is crystal-controlled, has an on-board, rechargeable battery to keep the clock running during down times and has software for calendar and clock routines contained in on-board ROM. An interrupt feature also is provided, which can be programmed to make efficient use of computer time.

Suggested uses for the clock include programming a morning printout of appointments with it or creating games in which elapsed time is important. It also can be used for the real-time control and monitoring of remote devices over regular AC wiring.

The Apple Clock costs $199 from Mountain Hardware, Inc. at 300 Harvey West Blvd., Santa Cruz, Calif. 95060.

Seminar on Micro Tests Slated for June 11-15

NEWTON, Mass. — "Testing Microprocessor-Based Systems," a five-day intensive seminar for design and test engineers, will be held June 11-15 at The Colonial Hilton Inn in Wakefield, Mass.

The workshop, directed by Dr. Glen Marston, will include guest lectures, demonstrations and provide assistance on work-related problems submitted by participants.

Emphasis will be placed on product design practices influencing testability, test equipment capabilities and limitations and test programming diagnostic software development.

The $495 tuition includes extensive course notes and a reception with seminar faculty on Monday evening. Additional information can be obtained from Prof. Donald D. French at the Institute for Advanced Professional Studies, One Gateway Center, Newton, Mass. 02158.

Mitre Report Indicates: Libraries Getting Micros

(Continued from Page 81)

Serials control is a complex problem for libraries since there are so many periodicals, many of which come out weekly. A typical university library may have 25,000 active serial subscriptions, which may result in 100,000 individual issues or 300 to 500 copies arriving daily; all of which must be checked, cataloged and distributed.

Serials control systems were designed to handle the logistics of obtaining and distributing issues of periodicals to patrons. The requirements for such micro systems include reordering, renewing and canceling subscriptions, creating bibliographic records and a catalog, receiving new issues and claiming missing copies, the report outlined.

Many small business computers also are being used in the administrative departments of libraries, performing accounting and general office functions as well as word processing, the report found.

Selection Criteria

In selecting a system, cost and performance must be weighed, the report advised. Micros are ideal for library environments since they are relatively noiseless, require little power and can operate in a "dirtier" environment than larger systems, the report said.

Micros will perform services traditionally not offered by libraries, the report predicted. For example, speech recognition systems and microcomputers could be used in an acquisition system to communicate directly and enter requests and data.

Eventually, patrons may access a library's collection via their own personal computers and revolutionize the concept of the traditional library, the report stated.

Microcomputers In Library Automation was prepared by the Mitre Corp. under an Office of Education grant. The Mitre Corp. is one of six federally funded R&D centers. It specializes in system planning and engineering. The report (MTR 7938) may be ordered for $3 from the Mitre Corp., M/S W-101, 1820 Dolly Madison Blvd., McLean, Va. 22012.

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Lloyd's May Lose Millions on Lessors

By Marcia Blumenthal
CW Staff

LONDON — When Lloyd's of London wrote insurance from 1974 to 1977 that guaranteed a revenue stream for computer lessors, it was betting on the continuing demand for leased equipment.

While Lloyd's rightly banked on the acceptance of general-purpose computers, it apparently didn't anticipate plummeting hardware prices and ensuing reductions in lease rates.

Because of declining lease rates, some lessors have already collected on these "J" policies, as they are known. These policies essentially guaranteed lessors that lease revenues would cover a portion of the original cost of the equipment.

Lloyd's, a syndicate of insurance underwriters that has built a reputation for insuring risky assets, confirmed it has paid some claims for "J" policies.

"We have payed some claims, but we've got quite a lot of equipment that is under notice and coming off lease this year. When this comes along, we will have to consider the question of payment of claims," Murray Lawrence of Lloyd's told *Computerworld*. Lawrence heads the special committee at Lloyd's examining "J" policy claims.

High-ranking executives at both Itel Corp. and Federal Leasing, Inc. confirmed their companies had already received payment for some claims. However, they refused to discuss the matter in any further detail, except to say their firms would be making additional claims.

Extent of Liability

What is Lloyd's liability? The loss could total $230 million, Lawrence said, citing a report prepared for Lloyd's by Toplis and Harding, a prominent English loss adjustment firm. "This is the only authoritative report," Lawrence stressed.

Lloyd's wrote "J" policies for 15 to 17 selected leasing firms, mostly in the U.S., Lawrence disclosed. While Lawrence said he didn't know the total face value of the insurance written, one industry source said Lloyd's wrote about $1 billion in "J" policies, covering primarily IBM 370 equipment.

Premiums for this insurance varied between 1% and 2% of the insured value, according to Paul Raynault, vice-president of Computer Financial, Inc. (CFI), formerly Computer Finders, Inc.

In all, Raynault and other industry sources estimated that Lloyd's collected between $10 million and $50 million in premiums. Lloyd's stopped writing "J" policies in early 1977.

CFI was instrumental in arranging equipment financing and "J" coverage for Decimus Corp., Raynault maintained. (CFI is now suing Decimus for failure to

(Continued on Page 86)

Outpaced by CDC, NCR

IBM's Earnings Growth Lags in Quarter

While IBM's first quarter revenues growth kept pace with that of other mainframers, its earnings growth trailed behind in the financial dash of the first quarter.

IBM clocked in a 13.2% increase in earnings compared with the 78% increase of NCR Corp., the 69% increase of Control Data Corp. and the 26% increase of Burroughs Corp.

For the first quarter, IBM's revenues jogged ahead by 19.5%, totaling $5.2 billion compared with $4.4 billion in revenues in last year's first quarter.

Earnings were $667 million or $4.57 per share compared with earnings of $589 million or $402 per share in the same period a year ago.

Commenting on the results, Frank T. Cary, chairman, said, "Purchases of data processing equipment increased substantially over the comparable 1978 period, making a significant contribution to the overall increase in gross income." However, he noted growth in earnings was offset by rising costs and expenses, particularly in the buildup of the company's resources and the increasing effects of inflation.

Moreover, IBM experienced a foreign exchange loss of $38 million compared with a gain of $30 million in the first quarter last year.

The growth in revenue derived from sales of equipment was 38.7% compared with the 9.9% increase in the revenue from rentals and services.

Analysts in New York expressed disappointment in IBM's earnings performance for its first quarter, which dipped below IBM's 15% goal. The price of the company's stock dropped eight dollars shortly after the announcement of the financial results.

Leading the Sprint

Leading the sprint in earnings, NCR reported earnings of just over $30 million or $1.13 per share compared with earnings of $22.8 million or 83 cents per share in last year's first quarter. Earnings for 1978 have been restated to reflect the sale of NCR's Appleton Papers Division.

Revenue from continuing operations grew 17% in the first quarter, totaling $590.4 million, up from the $505.1 million in revenues in the same period of 1978.

Improved earnings in the first quarter resulted from more cost-effective new products and production economies for continuing products, NCR chairman William S. Anderson said.

While Anderson said he did not expect subsequent quarters this year to match the first quarter's gains, he attributed the first quarter's growth in part to higher interest

(Continued on Page 87)

Chip Makers Push Copyright To Prevent Design Piracy

By Marcy Rosenberg
CW Staff

SAN JOSE, Calif. — Congressional subcommittee hearings began here last week to weigh a proposal to provide copyright protection for imprinted design patterns on semiconductor chips.

A bill (H.R. 1007) to amend the Copyright Act of 1976 was recently introduced in the House of Representatives by Congressman Don Edwards (D-Calif.) to address concerns voiced by members of the San Francisco Bay Area's semiconductor industry who have been victims of foreign and domestic "chip pirates" — or commercial chip copying services.

The bill calls for an amendment to Section 101 of Title 17, U.S. Code, to include two additional items under the cateogry, "pictorial, graphic and sculptural works" eligible for copyright protection.

These are "the photographics masks used to imprint patterns on integrated circuit [IC] chips" and "the imprinted patterns themselves even though they are used in connection with the manufacture of, or incorporated in, a useful article."

This latter clause was inserted in the bill because any design dictated by the function of the article that uses it cannot be protected under current copyright law, according to a spokesman for the Library of Congress Copyright Office.

To decide if semiconductor chip designs are original expressions of an author — and therefore, not determined by the function of the device — the House referred the proposed bill to the Judiciary Subcommittee on Courts, Civil Liberties and the Administration of Justice for review.

Witnesses set to testify at the hearings include L.J. Sevin, Mostek Corp. chairman; Andrew Grove, president and chief executive of Intel Corp., on behalf of the American Electronics Association; Dr. James B. Angell, professor at Stanford University's

(Continued on Page 89)

Small Firms Glow in INC. 100

BOSTON — Computer industry firms represented 21% of the 100 top performing small businesses, according to a survey published by a new business magazine.

The INC. 100, as the survey was dubbed, was compiled by editors at *INC.*, a monthly magazine aimed at small businesses, which premiered this month.

Those companies which qualified for listing on the top 100 were independent, publicly held firms in the manufacturing or service industry with at least three-year financial histories and earnings and sales growth during their latest fiscal periods.

Sales must have been $25 million or less in 1974 or in 1975 to 1976 as the firm became publicly owned.

Tandem Computers, Inc., Cray Research, Inc., Amdahl Corp. and Prime Computer, Inc. placed among the top 20 companies.

A profile of these firms show that they are young; all but 15 firms have incorporated since 1960 and 47 incorporated during the last decade.

'Spectacular Growth'

All firms have had spectacular growth in the past five years, the survey revealed, with 98 companies tripling sales and 73 tripling earnings as well during that period.

On the average, the compound annual growth rate was 44%. *INC.* reported. Computer firms on the list averaged a compound annual growth rate of 75%. However, Tandem Computers with compounded growth of 547% skewed the average.

Discounting the highest and lowest per-

(Continued on Page 88)

Digital Equipment Corporation

INTERACTIVE USER REPORTS

"Productivity is up 50%."

Harry Wolford, Director of Computer Services and Statistical Reports, Ohio State Department of Education, Columbus, Ohio.

Productivity.

"We do all the computing for the State Department of Education in Ohio, plus some legislative support work for the Governor's office, the Ohio General Assembly, and other state agencies.

"When we switched from batch to the DECSYSTEM-2050, the productivity of our programmers went up easily 50%. Programmers like the 2050 so much that if we went back to batch tomorrow, we'd probably lose 75 to 80% of them.

"And for its price, the 2050's communications power is simply unbeatable."

Software Compatability.

"Our applications include oil and gas exploration and financial planning using an economic model.

"We started with a DECSYSTEM-2040, but people found it so easy to use, they just went wild over it—we were doing five times the anticipated workload in just four months. So we upgraded to a DECSYSTEM-2050—another 250K bytes, one more disk and channel, and cache memory.

"The conversion took less than an afternoon—with absolutely no software changes. We just told the machine it had more memory, and that was all there was to it."

H. B. Taylor, Director, Houston Computer Center, Allied Chemical Corporation, Houston, Texas.

Ease of Use.

"As a service bureau, one of our biggest concerns is ease of use for our customers. We had been accustomed to a competitor's user interface that we thought was superb, but the TOPS-20 interface was clearly superior.

"Reliability has been super. Our 2020 came up in one day and has had a mean time between failures of over 300 hours.

"And since the 2020 is the start of a whole family of software compatible machines, we have many avenues for expansion."

Dr. Paul Whalen, President, Interactive Computing of Vermont, South Burlington, Vermont.

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digital

Lloyd's Losses May Grow As Users Return Gear

(Continued from Page 83)

pay monthly contract fees [CW, Nov. 27]). Executives at Decimus did not respond to *Computerworld's* telephone calls last week.

Wants Leases Renewed

Recalling negotiations on behalf of Decimus with the British insurance syndicate, Raynault said Lloyd's major concern was that Decimus, subsidiary of Bankamerica Corp., and other lessors were typically writing four-year leases, although the full payout for the equipment took seven years.

Lloyd's wanted assurances from lessors that their customers would renew their leases. This was because Lloyd's was not insuring the residual value of the equipment, but rather a stream of lease revenues during the seven years the leasing company was repaying the firms financing the equipment, Raynault explained.

To allay Lloyd's apprehensions about lease renewals, a group of lessors met with it. During this meeting, which Raynault said he attended, various lessors made presentations to Lloyd's, demonstrating that lessees renewed their lease contracts 85% of the time. This renewal rate, based on the lessors' study, satisfied Lloyd's, Raynault claimed.

The mistake Lloyd's made was that "it did not make any determination of how low the lease rate would have to be before a lease was renewed," Raynault asserted. Rather Lloyd's wrote insurance banking on the original lessees renewing their leases, he added.

Currently, many of those initial four-year leases are expiring. These expirations, combined with recent steep drops in 370 lease rates resulting from IBM's 4300 introduction in February, virtually guarantee lessors will be filing many claims with Lloyds.

'Due Diligence' Clause

In the near future, many lessors will be putting Lloyd's on notice that they will not be able to realize lease revenues as insured, Raynault surmised. Giving notice of the intent to file a claim, is the first step in the claims procedure, Raynault explained.

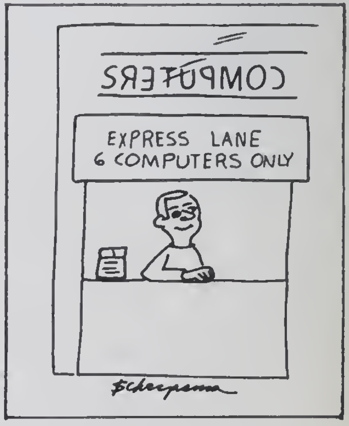
However, before collecting on the revenue shortfall, lessors must attempt to remarket the equipment as if they were not covered by insurance. This policy requirement is known as the "due diligence" clause.

Speculation has arisen about how aggressive Lloyd's will be in trying to prove that lessors have not acted with diligence in remarketing equipment. It appears too early to tell, though, to what extent Lloyd's will go in order to minimize its liability, one industry source observed.

To cope with the anticipated onslaught of claims, Lloyd's recently appointed the First National Bank of Boston to "provide the appropriate financial and related services in connection with insurances on leased computer equipment."

The First National Bank, in turn, has set up a special division for managing Lloyd's business, including the remarketing of computer equipment, if necessary.

Peter Manning, who heads this division, said he was not at liberty to discuss the specifics of the bank's arrangement with Lloyd's.



NOTICE OF INTENTION TO ISSUE RFP

Scenic General Hospital, a 134-bed acute-care facility, is preparing to release an RFP document for installation of a computerized hospital information system. The hardware and software system must provide for census, outpatient registration, billing, accounts receivable, and financial reporting (that meets CHFC requirements). Parties interested in being added to the RFP distribution list should submit company name, address, and phone number to: Stanislaus County Purchasing Agent, 1100 "H" Street, P.O. Box 3229, Modesto, California 95353 (Telephone: (209) 526-6319). The RFP is expected to be released on or about Friday, April 27, 1979. This notice is not a request for proposal.

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Write or call us about CDPS: the product of the 80's for Series/1. Tominy, Inc./4152 Crossgate Drive/ Cincinnati, Ohio 45236/513-984-6605.

TOMINY INC.
CREATORS OF CDPS: THE DISTRIBUTED DATA BASE/DISTRIBUTED PROCESSING SYSTEM FOR SERIES/1

Consulting Firm Shows Entrepreneurial Flair

By Marcia Blumenthal
CW Staff

CAMBRIDGE, Mass. — While Arthur D. Little, (ADL) Inc. is primarily known as a high-powered research and consulting firm, the company also has an entrepreneurial side.

For the past 20 years, ADL has been on the trail of new products suitable for commercialization. Five years ago, this activity became a separate profit center within the company and was dubbed Arthur D. Little Enterprises.

That group is considered the invention management and equity development arm of the company.

Licensing products to manufacturers is the primary way ADL Enterprises rewards itself for taking risks readying these high-technology products for the marketplace, according to Walter J. Cairns, an ADL vice-president and manager of the Enterprises group.

Equity Investment

Equity investment in some of these manufacturers is another activity ADL Enterprises considers profitable, Cairns explained. As ADL works with these companies, it often realizes their potential. Such was the case with Azurdata, Inc., a portable data entry equipment maker of which ADL recently purchased an 8.3% interest.

That investment resulted from a licensing agreement which gave Azurdata manufacturing rights to a solid-state memory device developed by ADL.

ADL does not usually participate in the management of the firms in which it has purchased an equity interest. Rather, it often helps the company identify new market opportunities for its products or helps it to make its business more efficient, Cairns said.

Cairns estimated ADL Enterprises reviews about 400 or 500 high-technology products every year, with about one-third of those products related to computer technology. Usually 10% of the products reviewed are generated internally by ADL personnel, with the remainder submitted by outside inventors.

Those products that have already been reduced to the prototype stage are preferred, Cairns said.

After reviewing potential products, ADL selects about 30 products to prepare for commercialization. "Out of 30 products, we succeed in arranging licenses in about 50% of the cases," Cairns maintained.

Product Development

Once a product is accepted, ADL makes expenditures for the technical development of the product, patents and market analyses, with an eye to ultimately marketing the product.

In addition, ADL seeks out appropriate manufacturers for the product. If ADL cannot obtain an outlet for a product within a year, all rights revert to the inventor, Cairns said. If licensing rights are sold, ADL splits the fees with the inventor, usually on a 50/50 basis.

For the past several years, ADL Enterprises has shown profits of about $1.5 million to $2 million on licensing revenues. "We are prepared to spend up to that amount to fund projects," Cairns said.

Recently, the enterprises group surveyed the characteristics of inventors submitting products. In general, ADL found several common characteristics. Most inventors are well-trained technically and often have a considerable reputation within their area of expertise. Moreover, they do not usually work for large firms, nor are they educators, Cairns said. Based on past activities, most have demonstrated an entrepreneurial spirit.

Mainframers Set Quarter Records

(Continued from Page 83)

income and lower long-term debt expense. NCR reduced its long-term debt by $219 million during 1978, he pointed out.

During its first quarter, the company reaped a substantial gain in orders, a good portion of which was for the new MP series of processors, Anderson said.

Strong Finisher

Like NCR, CDC was a strong first-quarter finisher. Continued corporate revenues totaled $717 million compared with revenues of $604 million in the first quarter a year ago. Earnings totaled $25 million or $1.45, up from the 15.7 million or 90 cents per share earned in the first quarter of 1978.

Revenue from CDC's computer business totaled $492.1 million, up 23% from revenues of $400.3 million in last year's first quarter. Earnings charged ahead, totaling $11.7 million, up 69% from the $4.3 million earned by the computer-related portion of the business during last year's first quarter.

In the first quarter of 1979, CDC's computer business comprised 68.6% of the firm's total revenues and 47% of its total income, compared with the 66% and 27% reported in the corresponding period a year ago.

Burroughs crossed the first quarter finish line with earnings of $42.2 million or $1.03 per share, up 26% from the $33.5 million or 82 cents per share earned during the same period of fiscal 1978. This was a departure from Burroughs' usual earnings growth of 15%. Revenues climbed 17%, reaching $588.4 million.

SMALL SYSTEMS POWER

1980s Outlook for Small Mainframes

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- APPLICATIONS
- ECONOMICS
- COMMUNICATIONS

Small systems are no longer "mini" or "micro" in the power of usable memory, processor capability and versatility! This development has been obvious to industry observers for several years with the advent of the so-called superminicomputer, but now that IBM has put large system power in a small ("E" Series) mainframe in terms of size, cost per transaction, and total price, it's clear to the entire computer-using industry worldwide that small systems have arrived as a major force for almost every end user in the EDP environment!

Small systems haven't replaced big systems, they've amplified their power through communication networks and a hierarchy of new applications. This leverage has just begun, according to the panelists who will be assembled for SMALL SYSTEMS POWER to be held at the Boston Museum of Science, May 22 & 23. The full range of small systems from board oriented through E Series will be discussed by leading consultants, vendors, users and university authorities. SMALL SYSTEMS POWER IN THE 1980s will provide new insight as to the economics, risks and payoff of future small systems applications and technology.

SMALL SYSTEMS POWER in the 1980's" will address key issues such as:

- Accelerating price performance trends in small systems, as users get closer to the processing power provided by advanced semiconductor technology. Which vendors will give the best package?
- Big mainframe software tools such as data base management systems will "fit" into small systems. How will this impact the use of large mainframes?
- Re-decentralization of data processing and files may occur as branch offices and plants again reinstall their own system instead of terminals. How will central management control this data base proliferation?
- All mainframes in a network environment boost demands for economical, high speed, broad bandwidth data communications. How will the carriers meet this challenge?
- Plug compatible mainframes will cover the full range of the IBM product line. How will users sort out the vendors? What role will service organizations selling small mainframes play?

Speakers scheduled for SMALL SYSTEMS POWER IN THE 1980s:

Anderson

Crockett

Doll

Fertig

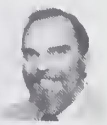
McGovern

Mertz

Moran

Rockart

Senft


Smith

Dr. Jared A. Anderson
President, Two Pi Corporation
Uses of IBM Compatible Minicomputers in DDP

Alan Baumgartner
Director of Strategic Planning
National Semiconductor Corp Systems Group
Impact of Semiconductor Technology in the Computer Room

David Crockett
Program Manager, Advanced Computer Systems, Hewlett-Packard Corporation
Impact of Silicon-on-Sapphire Technology on Small Mainframe Performance

Dr. Dixon Doll
President, DMW Associates
Communication and Data Base Opportunities in Small Mainframes

Robert A. Fertig
Vice President & Director
Technology Analysis Group
Advanced Computer Techniques, Inc
E-Series Technological and Market Impact

Patrick J. McGovern
Chairman
International Data Group, Inc
User Expectations in Small Systems Technology

C. Oakley Mertz
Vice President-Research
International Data Corp
Market Structure and User Migration Dynamics in the Small Mid Range Mainframe Arena

Jack Moran
Systems and Data Processing Manager
Butler Manufacturing Co.
Small Systems Planning for Medium Size Companies

John Rockart
Director, Center for Information Systems Research, MIT Sloan School
The Application Backlog for Systems "Friendly" to End Users

Michael Senft
Marketing Director
Nanodata
Microcode & Its Associated Benefits Applications

Richard French
Minicomputer Product Manager, Cincom Systems
Impact of Small Systems Architecture on Data Base Management

David Smith
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Please reserve ———— space(s) @ $500 per attendee at IITI's two-day SMALL SYSTEMS POWER. I am including the names of all those (beside myself) who will attend on a separate piece of paper. I understand that the fee includes program materials and reproductions of speakers' visual aids, lunches, refreshments, cocktails - *but not hotel accommodations.* I further understand that cancellations must be made by May 15 or be subject to a $150 charge.

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Sony/Tektronix Markets Outside Software

By Marcy Rosenberg
CW Staff

SAN DIEGO — To move more aggressively into the Japanese business graphics market, Sony/Tektronix Corp. has agreed to market applications software from an outside vendor.

Under the exclusive agreement, Sony/Tektronix — a 50/50 joint marketing venture in Tokyo — will sell in Japan two computer graphics packages developed by Integrated Software Systems Corp. (Issco) here, along with its line of Tektronix Corp. graphics terminals and peripherals.

The agreement marks Issco's entry into the Japanese market, according to Peter Preuss, president of the $2 million firm.

Issco's line consists of Tell-A-Graf, which uses an English command language and is suitable for first-time commerical users, and Disspla, a Fortran subroutine library designed for "relatively untrained" Fortran users, Preuss said.

Both packages were said to be hardware-independent and to allow for a variety of graphics including pie charts, bar graphs and three-dimensional visual presentations.

Two Markets Targeted

Formed to market Tektronix graphics, test and measurement equipment in Japan, Sony/Tektronix will target the Issco software to the business community as well as to its existing base of customers who use computer graphics for computer-aided design and engineering and laboratory research and development applications.

The Tokyo-based marketing organization has been serving these noncommercial graphics markets with Tektronix 4051 stand-alone graphics terminals, 4027 color graphics terminals, 4631 printers and Tektronix Plot-10 terminal control system (TCS) software, according to Yoshio Takahashi, product manager for the Sony/-Tektronix Information Display Division.

Takahashi and Preuss agreed the Issco software products — to be sold separately from hardware offerings — will not compete with TCS, a basic software program used to run Tektronix graphics hardware.

By comparison, Issco packages provide for a wider range of graphics capabilities suited to the commercial user, Preuss noted.

In addition, a new 3.0 version of Tell-A-Graf includes a number of options to allow users to generate visual aid text plots and perform text-handling.

Depending on options, prices range from $19,500 to $23,500 for Tell-A-Graf; $24,500 to $45,000 for Disspla.

Computer Firms Rate Near Top Of INC.100 List

(Continued from Page 83)

formers in the computer group, the compounded annual growth for computer firms was about 54%.

The ratio of net income as a percentage of sales for these companies was 8.7%, just above *INC.'s* average of 8.5% for all firms.

The survey also found that the fastest growing companies appeared to be clustered geographically in California, New York, Texas and Minnesota.

Firms May Outgrow List

Although *INC.* did not specify the limit on sales for classification as a small business, it predicted that in five years, 95% of the firms on the list would be too large to qualify for inclusion on the list. By some industry standards, Amdahl — with sales of about $321 million in 1978 — may have outgrown its small business status.

Computer firms on the INC. 100 from highest position to lowest are as follows: Tandem Computers, Cray Research, Amdahl, Prime Computer, Rolm Corp., Mini-Computer Systems, Inc., Verbatim, Microdata Corp., Computer Task Group, Time Sharing Resources, Inc., National Computer Systems, Inc., Graphic Scanning, Telecredit, Inc., Computer Communications, Inc., Anacomp, Inc., Systems Engineering Laboratories, Inc., CACI, Inc., Scientific Time Sharing Corp., Penril Corp., Computer Automation, Inc. and Anderson Jacobson, Inc.

Ratings were based on analyses of statistics gathered from reference sources such as Moody's, Standard & Poors and the *Wall Street Journal Index*.

Booklet Subject: Bubble Memory

DALLAS — A data book on the Texas Instruments, Inc. TIB0203 magnetic bubble memory is available free from the company.

The book contains specifications on the TIB0203 and for the interfacing integrated circuits that were designed for use with the product. These include the SN74LS361 function-timing generator, the SN75281 sense amplifier, the SN75380 function driver and the SN75382 coil driver.

Included are data sheets for standard devices needed in bubble memory design such as the TSP102 thermistor and the VSB53 Schottky-diode bridge.

The manual can be obtained from TI's Inquiry Answering Service through P.O. Box 225012, M/S 308, Dallas, Texas 75265.

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Manufacturers Seek Copyright For Chip Design

(Continued from Page 83)

Department of Physics; and Jon Baumgarten, general counsel for the Library of Congress' Copyright Office.

IC chip suppliers to the $5 billion semiconductor industry currently have no way to legally protect their proprietary designs, according to Edwards, who noted patents usually cover only narrow circuitry aspects of chips.

"It takes 10 designer years of effort and 20 square feet of layout space to design and transform a circuit diagram into a one-quarter inch square chip containing 30,000 transistors," he explained.

While the cost of creating layout designs is skyrocketing, the technology for copying these patterns is improving through better lenses, photomicrographic techniques and control electronics.

Typically, Edwards said, competitors can purchase proprietary chips introduced to the market, remove impeding surface codings and commission a photomicrograper "usually in Japan," to blow up the layout design.

A chip pirate can then trace the blowup and feed design information into a computer as the original designer did from his own drawings," he remarked.

The original developer has no protection at all against the copier, according to Mostek's Sevin, who admitted to "several [pirating] incidents involving our products." For the most part a prime source of printed components, Mostek favors copyright protection for chip designs.

Other Reasons for Protection

Sevin and Edwards claimed they know of no opponents to the proposed copyright legislation. The Congressman said it will not impede the common industry practice of "reverse engineering" — that is, taking a few photographs of chip layers to trace the circuit schematic — if used for study or analysis, but not for duplicating purposes.

"If the pirating practices are allowed to continue, the American semiconductor industry no longer will be willing to finance new chip designs," Edwards maintained.

He fears government-funded Japanese companies "that do not need the profit levels we require to attract capital will, by our default, take over the original chip design efforts and eventually the entire market."

Nickels & Dimes

Comshare, Inc. has completed placement of $6 million in notes due in 1981 with an institutional investor. The notes, which bear a 10% interest rate, will be used to repay higher interest term notes and provide capital requirements. The company has already drawn on $4 million in notes and will use the remaining funds within the next few months.

Silicon Valley Upgrading Benefits

SUNNYVALE, Calif. — With labor shortages a problem for Silicon Valley's electronics industry, smaller firms are upgrading employee benefits to compete with those of larger companies, according to a recent survey by the Electronics Association of Calif. (EAC).

The most significant benefit increases since the 1977 EAC survey were in dental plans and vacation pay, two areas where larger firms traditionally outperformed smaller firms.

In 1977, only 50% of the survey participants reported offering any dental plans. Of the 120 small- and medium-size firms that took part in the survey conducted last year, 82% reported offering dental plans as part of their benefits packages.

Increases also were noted in the types of dental services covered by insurance. Nearly 25% of companies with dental plans offered orthodontic services for employees and dependents.

Vacations, Medical Plans

The survey also revealed that employees in the electronics industry earn the same number of annual vacation days they earned in 1977, but don't have to work as long to qualify for that vacation. Nearly 90% of this year's respondents reported granting 10 paid vacation days after an employee worked for one year compared with the two-year requirement most had in 1977.

Medical plans have changed little over the past two years, EAC said, with the large majority of plans offering 80% coverage after a $100 deductible, with a three-person ($300) maximum family deductible. More firms are offering full maternity coverage.

Grew Fast

EAC was formed in the San Francisco Bay Area in 1977 by executives from smaller firms who wanted to work collectively to develop management services and employee benefits normally offered only by larger companies. Since then, it has grown to more than 250 members and has offices in Sunnyvale and Orange County, Calif.

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Contracts

United To Buy Incoterm Units

CHICAGO — United Airlines, the nation's largest air carrier, recently signed a contract with Incoterm Corp. for 10,000 reservations positions to meet the expected requirements of the airline's nationwide Apollo reservation network over the next four years. The equipment released so far is worth $6.8 million, and shipments will begin immediately. The order is believed to be the biggest of its kind ever placed.

The equipment is destined for use by travel agents and by United and will join more than 6,500 Incoterm display and ticketing positions already installed by United in reservation centers, ticket offices and airports around the country. The equipment currently in use is valued at $26.7 million, bringing the total value of Incoterm equipment ordered by United to more than $40 million.

United announced earlier that it had signed with Delta Airlines to link that airline's travel agent customers to the Apollo network and that Delta had ordered another 1,500 Incoterm positions.

Evidence of Expansion

The orders are evidence of the rapid expansion of the airlines' computer reservation systems into travel agency offices. United is currently installing equipment in agencies at the rate of 40 offices a month, according to Glen Belden, vice-president of the Communications Services Division. Growing traffic volume, together with the extension of airline service to new cities under federal deregulation, provided the impetus for this expansion, Belden said.

The Apollo system has 11 regional reservation centers that communicate to a large central installation in Denver and keep track of 2 million reservations each day. Every second of the business day, approximately 175 simultaneous requests come in to Apollo, but no one waits for help for more than two seconds.

The Apollo system makes 128,000 reservations, 667,000 ticket quotes and 5,000 car reservations daily, in addition to printing 80,000 tickets.

Centronics Lands Display Data Pact

HUNT VALLEY, Maryland — Display Data Corp. recently signed a two-year multimillion dollar contract with Centronics Data Computer Corp. The contract calls for Centronics to supply its 6000 series band-line printer for use in Display Data turnkey systems designed primarily for automotive dealerships.

"The Centronics 6000 series offered the greatest operator appeal. We found it to be an eye-catching unit that would be very salable and easy to service," according to Bill Smith, purchasing manager at Display Data.

Display Data will incorporate the Centronics 6300 printer unit into its "insight" systems. These systems, designed primarily for automobile dealers and beverage distributors, are priced between $30,000 and $150,000.

Display Data anticipates increasing its installed base from 750 to 900 systems this year.

Growth Predicted In 'Dying' Card Mart

IRVINE, Calif. — The card reader market, which some industry observers call a "dying market," is growing at a 20% a year dollar rate, according to one card maker.

What's more, that market now consists of two distinct segments, traditional card readers and terminal-based readers, according to Dennis Mallon, vice-president of marketing and general manager of True Data Corp.

While card reader companies have undergone a shakeout in the past two years, those remaining are financially strong, Mallon maintained. At one time, approximately 11 firms supplied card readers; now, about three are left, Mallon said, pointing to Documation, Inc. as the major force in the market.

To meet the increased demand for these devices, True Data is strengthening the design capability of its engineering group, stressing high-volume designs. In addition, it is streamlining its production facility.

As Mallon sees it, the card reader market today consists of the traditional remote batch and program loading sector, which primarily uses readers operating at speeds of 400 card/min.

Although some readers attain speeds of 1,000 card/min, the traditional sector uses the 400 card/min readers 80% of the time, Mallon estimated. The price of this equipment has risen over the years; readers now cost about $2,000.

Terminal Applications

The more glamorous slice of the market, and the fastest growing, is the terminal applications area, Mallon noted. For the past two years, True Data has been building card readers which are integrated into terminals by OEMs.

Terminals outfitted with these readers are primarily used in low-demand applications in a distributed processing environment, Mallon said, pointing to the reading credit cards and badges as typical functions for these terminals.

While the demand for terminal-embedded devices is growing at a quick clip, prices for this equipment are low, usually about $500 a unit, Mallon said. Therefore, production runs must be as efficient as possible.

Executive Corner

- Claudette Smith has joined Computer Interface Technology as manager of equipment sales.
- Robert H. Sommers has been appointed vice-president of Informatics, Inc.'s International Sales Division. The division markets proprietary software products outside the U.S. and Canada.
- Walter F. Bauer, president of Informatics, Inc., has been elected to the board of trustees of the Charles Babbage Institute.
- Stan Mantel has been appointed manager of the disk storage manufacturing section of Memorex Corp.'s Large Storage Systems Group. In addition, Hall Mattice has been named manager of the Group's components manufacturing.
- Ronald R. Benanto has been appointed financial product marketing manager for Management Decision Systems, Inc.
- John Jurenko, national sales manager for Universal Data Systems, Inc., has been elected vice-president of sales by the company's board of directors.
- Melvin E. Stever has been named to the position of vice-president of marketing for Northern Telecom Systems Corp.
- Burke Crouse has joined Computer Systems of America, Inc. as executive vice-president.
- David Rubin has joined Network Analysis Corp. in the position of Director of Client Services.
- Dr. A. J. Nichols has been appointed to the position of vice-president of engineering at Millennium Systems, Inc.
- William M. Sheeser has been named president of Teldata Systems Corp. Earlier, Sheeser had been elected a director of the corporation.
- James T. Simpson has been named vice-president and chief financial officer of Data Access Systems, Inc.
- Robert W. Fischer, a financial consultant, has been elected to the board of directors of Compuscan, Inc.
- Jere L. Hill has been named manager of information systems for Leasametric, Inc.
- James A. Bowers and Henry G. Hugo have been promoted to the newly-created dual-role vice-presidencies of the Wyle Laboratories' Scientific Service and Systems Group and the Industrial Manufacturing Group.

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Work with some of the most sophisticated installations in the country. You'll support our IBM OS, OS/VS, DOS/VS and MVS System Performance and Programmer Productivity products. Qualified candidates will have demonstrated an ability to work well with people and should have solid experience in 2 or more of the following: OS or DOS/VS, COBOL programming, JCL and utilities, user training, or OS, OS/VS system tuning techniques.

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Become a member of our dynamic marketing management team. Ideal candidate will have marketing or Product Management experience with OS-level systems software products. Proven verbal and written communication skills and the ability to deal with sophisticated software products required.

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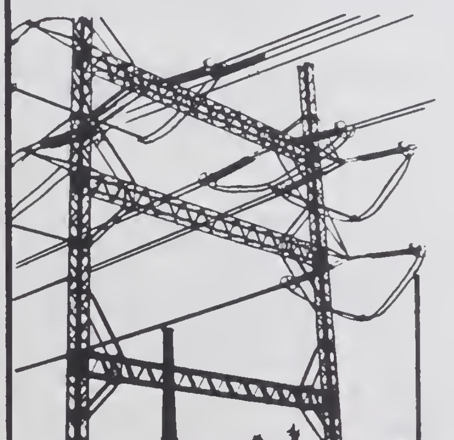

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CSC

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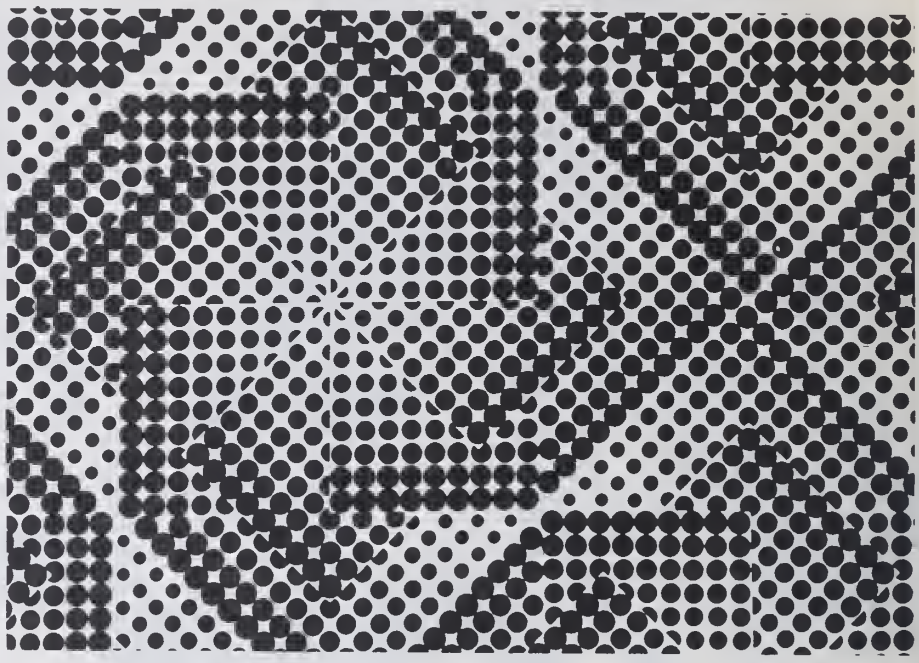

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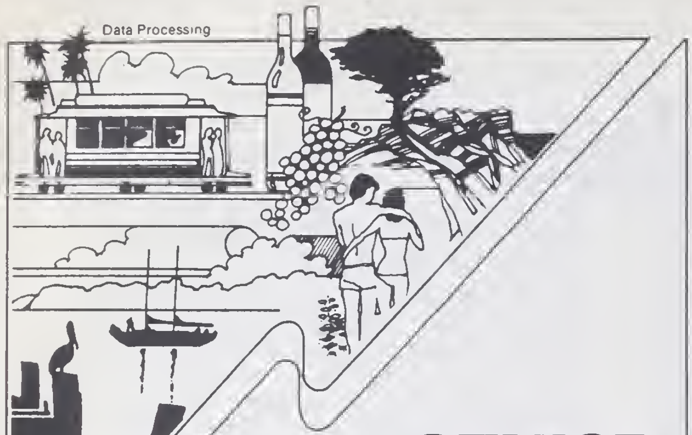

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Requires skills in the use of IBM 370 or HP 3000 computers (medium to large scale systems). Competancy on OS, VS I & II, MVS, HASP, MES 2 with RJE facilities is also required. Growth potential is unlimited here!

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SUPPORT PROGRAMS
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Preferred background will include a B.S. degree in Engineering, Mathematics, Physics, or Computer Science and 2-5 years of hands-on related experience, with at least one year of FORTRAN in a scientific programming environment. Electric power experience in supervisory control, data acquisition, or automatic generation control is an asset, as is a knowledge of ASSEMBLY.

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Career position for qualified programmer in the Biostatistics Department of an internationally prominent cancer research center. Projects include clinical trials, research in human genetics, bone marrow transplantation. Position requires degree in computer science or related field, experience with time sharing and file manipulation, and expertise in FORTRAN.

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PROGRAMMER ANALYST – responsible for the programming, implementation and maintenance of large and complex on-line systems. Applicants should have 3 to 5 years of COBOL experience in an OS environment. Financial institution background preferred.

SYSTEMS ANALYST – responsible for design and implementation of large and complex systems. Financial institution background and strong IBM on-line experience preferred.

SYSTEMS PROGRAMMER – responsible for the implementation and maintenance of operating software for an IBM 370. Experience with OS/VS, CICS and OS/JCL required.

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Network Production Support Supervisor

Position entails comprehensive responsibility for directing and coordinating production and associated technical support activities involving the smooth, cost effective operation of the corporate information services network. Duties include maintaining operating standards and procedures, reviewing new production systems/procedures, and production implementation. 2-4 years in DP design/analysis/programming, and 2-4 years production implementation and maintenance including managerial responsibility in these areas. Knowledge of the following: IBM 370; OS/VS; MVS; CIC; VM/CMS would be preferred. Strong managerial abilities, thorough understanding of JCL and the ability to troubleshoot systems and initiate corrective action a must.

Production Analysts

Reporting directly to the Network Supervisor primary emphasis will be maintaining corporate information systems, identifying existing or potential problem areas, and accomplishing necessary corrective action. 3+ years Batch on-line experience in a production maintenance environment that demonstrates achievement as a problem solver on the operational level essential.

Network Coordinator

This key position, in charge of providing direct support to network systems users, encompasses a wide range of activities ranging from problem resolution, documentation and tracking DP requirements to performing in the role as a liason between data center technicians and users. BS degree and 3-5 years systems analysis experience with emphasis or business applications plus working knowledge of CICS, VM/CMS, OS/VS required.

Take advantage of your technical know-how and growth potential in a state-of-the-art working environment with genuine advancement opportunities. Will provide you with an excellent salary and benefits package. For confidential consideration send your resume in confidence to:

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The ideal candidate will have skills in all data center functions with emphasis in programming and operations. Only individuals qualified to handle our total data processing responsibilities should apply.

This position provides excellent salary and benefits. Please send resume or letter describing your background and salary history in confidence to:

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PROGRAMMERS

Racal-Milgo, Inc., headquartered in South Florida, is a world leader in the data communications field. In order to keep pace with our record sales and continued growth, we have opened career opportunities at all levels for Programmers.

SOFTWARE DEVELOPMENT

SYSTEMS PROGRAMMERS - These positions involve systems design and development of communications networks, familiarity with PDP-11, RSX 11M, RT 11 and microprocessor based systems. Intel 8080, 8085 experience desired.

REAL-TIME APPLICATIONS PROGRAMMERS - Responsibilities include functional design and implementation of application related to the control of communications devices. This software will perform switching and controlling of communications network systems.

APPLICATIONS PROGRAMMERS - Should have a minimum of 2 years real-time assembly language experience in mini-computers, or microprocessors, communications, teleprocessing, remote batch, IBM 3270/2260. Uniscope 100/200/400, VIP 7700 exposure helpful.

ENGINEERING PROGRAMMERS - Your involvement will include microprocessor operating systems design, communication software development, real time software design, compiler design, terminal development, multiplexer software design.

MANAGEMENT INFORMATION SYSTEMS

BUSINESS SYSTEMS ANALYST - Individual must be able to analyze the broad MIS needs of the company and recommend new and improved system designs to management. Duties include design of business systmes, whether automated or manual, from the feasibility studies through post implementation audits. This position requires a minimum of 5 years broad systems experience, preferably in an environment utilizing a phased approach to systems design and a large computer system.

SYSTEMS PROGRAMMER - Must be experienced in implementing and maintaining Univac 1100 series operating systems. Responsible for implementing, enhancing, and maintaining DMS 1100, COBOL, QLP and other related software on a large Univac 1100 with multiple applications.

SYSTEMS SPECIALIST - Individual should have 3-5 years systems analysis and programming experience with business applications utilizing ANS/COBOL. Experience in Univac 1100 series and degree preferred.

DATA BASE ANALYSTS - Positions require implementing and maintaining of DMS-1100 data bases; documenting, designing and implementing load/reload programs, training of users etc. A minimum of 2-4 years of experience in COBOL and usage of DMS-1100 is preferred.

DATA BASE ADMINISTRATOR - Ideal candidate will have a minimum of 4-6 years of solid experience that includes COBOL, DMS-1100 and a working knowledge of TIP/CMS software on UNIVAC 1100 machines. Duties include supervising data base analysts, designing new data bases, maintaining current data bases, interfacing with users, fine tuning of data base etc. Salary extremely competitive.

Send your resume in complete confidence to Rod Manning, c/o:

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Miami, Florida 33166
Telephone (305) 592-8600

Engineer

CUSTOMER ENGINEER

At CRAY RESEARCH INC. we design, build, market and support Superscale computers used in scientific application. We currently have openings for talented computer professionals for assignment at several sites. Several years experience on large-scale computer systems a valuable plus.

After several months training on the Superscale CRAY 1, the successful candidate will be assigned to a customer site. These positions offer excellent growth opportunities, salary and company benefits. Send resume and salary history in complete confidence to:

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PROFESSIONAL SERVICES

Providing extensive consulting services to users of the NCSS network, individuals within this group typically have a background in large scale systems (preferably timesharing), COBOL, and DBMS.

- SYSTEMS CONSULTANTS
- SYSTEMS ANALYSTS
- PROGRAMMER ANALYSTS

To explore these positions, please forward your resume, with CURRENT SALARY, to: Richard Brittain, Corporate Recruiter, National CSS, Inc., 542 Westport Avenue, Norwalk, CT 06851.

SYSTEMS (SOFTWARE) DEVELOPMENT

This department, consisting of a number of highly capable individuals, provides systems programming development and support for operating systems, DBMS, networking, product design, and the NCSS 3200 superminicomputer.

- MANAGER - Systems Software Development for the NCSS 3200
- SENIOR SYSTEMS SUPPORT PROGRAMMERS - Network and NCSS 3200
- SYSTEMS SUPPORT PROGRAMMERS - Network and NCSS 3200
- SYSTEMS PROGRAMMERS - DBMS Internals
- SENIOR SYSTEMS PROGRAMMERS - Network Applications
- SYSTEMS PROGRAMMERS - Operating Systems Development
- SENIOR PRODUCT DESIGNERS - Software Products
- PRODUCT DESIGNERS - Software Products

PRODUCT MARKETING

Members of this department are responsible for the various facets that go into determining what products are needed in the marketplace and how they will be presented and supported. Individuals typically have come from the DP sales or marketing sector or from similar roles in other data processing organizations.

- PROJECT MANAGER - DBMS Products
- MANAGER-TECHNICAL SERVICES - DBMS Products
- PRODUCT MANAGER - Accounting Products
- PRODUCT CONSULTANT - Engineering Products
- MARKET PLANNING SPECIALIST

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MAI

SYSTEMS ANALYSTS DESIGNERS

The University of Georgia is seeking experienced data processing professionals to work in the design and implementation of administrative computer-based information systems. Experience should include computer-based information systems design, data base management systems, large-scale computing systems, and software development project management. Assignment will be on either financial or student systems application areas. Familiarity with IBM 370/158 MVS, IMS and TSO or similar environments is desirable. A bachelor's degree or equivalent experience is required.

The starting salary is competitive and will be commensurate with background and experience. Excellent fringe benefits include five weeks leave/holiday, generous sick leave and low-cost individual group life and health insurance.

Located only 65 miles from downtown Atlanta, Athens offers the convenience of a nearby metropolitan area, yet retains its university town atmosphere. This is an excellent opportunity for the right person to participate in large-scale systems development and maintenance while living in an academic environment.

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Systems Development Manager

Our dynamic growth and recently expanded data processing department have created a challenging career opportunity for a Systems Development Manager to direct systems development activities including systems analysis, systems design, and programming. Responsibilities will include overseeing large scale projects for development or major modification of information systems, from concept to full operation. You will plan and administer a staff of analysts and programmers, and furnish planning, consultation and advisory service on systems development to using department.

Requirements for this position include a Bachelor's degree, preferably in mathematics, computer science or business, and 6-8 years in data processing with demonstrated project management ability in a variety of application areas. Minimum 2 years as a Development Manager is required, as is previous training in management practices, administrative management, project control, analysis and design techniques, and planning. Working experience with OS/VS1, CICS/VS, DL/1, DOS/VS is necessary; familiarity with structured design desirable.

In addition to excellent working conditions, you will receive a generous starting salary and be part of Matson's outstanding fringe benefit program. For immediate consideration, please submit your resume and salary requirements to **M.A. Dineen, Matson Navigation Co., P.O. Box 3933, San Francisco, CA 94119.**

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32-bit

We at Perkin-Elmer's Computer Systems Division believe that technological innovation is the most effective vehicle for providing professional growth. It is a Perkin-Elmer hallmark to challenge our computer professionals to the very limit of their technical capabilities. We are proud of our track record - here are some of the firsts we've been responsible for:

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HARDWARE DEVELOPMENT

CPU DESIGN

Junior and Senior Designers to play a strong role in resolving architectural issues, use good judgement in making design trade-offs and implementing logic. Ideal candidates will have experience in logic design and test, be capable of defining new computer architecture and be familiar with TTL, ECL, and MOS technologies.

PERIPHERAL INTERFACE DESIGN

Junior and Senior Designers with knowledge of minicomputer peripherals to develop forward-looking interfaces. Ideal candidates will be familiar with at least one minicomputer peripheral and have previous design experience with MSI/LSI.

MECHANICAL DEVELOPMENT

Positions require BSME with 3 to 5 years experience or equivalent to be responsible for all phases of electronic equipment packaging. You should have experience in the development of cabinets, chassis, techniques for cooling electronic equipment, and printed circuit packaging as related to the computer industry.

PRODUCT SUPPORT

Use your academic background and programming or hardware experience to design, implement, test, and document test program diagnostics and microprograms. You will apply your knowledge of computers and peripherals to a variety of complex problems, and will develop complete knowledge of the processor from an assembly language programming point of view.

CONTINUATION ENGINEER

Use your troubleshooting skills to develop and/or design improvement techniques for implementation in hardware components. You will recommend and/or implement design changes in new products to provide enhancements or cost reduction. Requires at least 2 years experience testing and troubleshooting computer systems and/or associated peripheral equipment.

COMPONENTS ENGINEER

Work closely with hardware development departments to establish and maintain a list of standard parts (both mechanical and electrical), design standards, material specification and finish specification. Requires BSEE and at least 2 years experience as a designer or standards engineer. Quality assurance experience would be helpful.

SOFTWARE DEVELOPMENT

SCIENTIFIC & SUPPORT LANGUAGES

Systems programmers to do compiler design and implementation in ongoing development of our FORTRAN VII system. Development includes additional global optimization, enhanced development support tools, and sophisticated runtime support and testing tools. Must have strong knowledge of compiler techniques, FORTRAN, and assembly language programming.

DATA COMMUNICATIONS/ NETWORK DESIGN

Senior systems programmers to design network and data communications products. Opportunities exist to interface IBM, SNA, X. 25, micro-terminal systems, and internal Perkin-Elmer networks. Must have experience implementing data communications drivers, link protocol, and familiarity with general operating systems and hardware architecture.

ADVANCED SOFTWARE ARCHITECTURES

Senior programmers to design and implement compilers for new languages and support systems. Specific duties include language specifications, compiler design, runtime support, language utility, etc. Engineering and mathematical background preferred along with related implementation experience.

SOFTWARE QUALITY ASSURANCE

Systems programmers to perform functional testing and validation of standard software products used in the full range of hardware product configurations. Computer science, math, or EE training with related experience in maintenance or design and testing of systems software; prefer extensive user oriented experience.

OPERATING SYSTEMS

Software engineers with experience on a variety of super mini or mainframe to participate in development of State-of-the-Art operating systems. Should possess demonstrated leadership qualities and the ability to contribute in all phases of the

at the forefront of technology

product life cycle including specification, design, implementation, test and maintenance.

SOFTWARE DOCUMENTATION

Technical writers to research, write and edit programmer reference and user software manuals. Must be able to write from software specifications and to interface effectively with software development and publications personnel. Knowledge of operating systems, programming languages, or data communications as well as software concepts and terminology.

MARKETING

MARKET MANAGERS/ SPECIALISTS

(Small and Medium L.O.B.)

Background in industrial automation, computer-aided design/computer-aided manufacturing desirable. Candidate will provide market input and direction for further penetration of industrial automation market sectors. Responsible for market research and planning, preparation of market plans, communication of plans into product directions and needs, preparation of market and sales aids, and communication with field sales. Technical and/or marketing background required with 3-5 years industrial experience and good communicative skills (written and spoken).

PRODUCT SPECIALISTS

Opportunities for results-oriented candidates with proven track record to be responsible for directing product strategies to meet market requirements, establishing requirements for specific products, developing merchandising literature, and providing technical support for a worldwide field force. Three years relevant experience and significant exposure to sales or marketing required as well as a BS in computer science or related field. Positions open in the areas of computer systems hardware, peripheral devices, and scientific languages (FORTRAN, PASCAL, CORAL 66, and Assemblers).

COMPETITIVE ANALYST

Candidate will help track the progress of products available in the industry and participate in product and market planning. Position requires a BS in a computer-related field and 2-3 years experience in the computer field or as a computer user.

MANAGER - MARKET PLANNING

Opportunity to play key role in marketing activities related to both market and product planning. BS degree in a computer or business-related field and 3-5 years experience in a marketing or planning capacity are required.

SALES TRAINING MANAGER

Challenging opportunity to make use of your computer knowledge, platform instruction techniques, and sales experience. Requires an individual who can design, document, and execute a complete sales training program to fulfill the requirements of both experienced sales personnel and sales trainees. Must be a strong motivator with enthusiasm, strong communication skills, and organization and technical competence. Training background with some sales experience in a computer or computer-related field required.

INTERNATIONAL MARKETING SPECIALIST

Requires initiative, leadership, organization, and superior communication skills with proven marketing expertise in computer systems hardware and software. Assists in defining products and services aimed at serving the computing needs of the worldwide minicomputer market. Responsibilities include development and execution of market studies, definition of market plans, merchandising products for introduction into the international market, developing sales aids and product literature suitable for use internationally, and providing support for these products and services to the worldwide sales fôrce. Requires a results-oriented self-starter capable of functioning with a variety of products in an extremely diverse marketplace.

SYSTEMS

These positions require a mix of hardware and software skills plus the desire to work in a fast paced customer oriented environment.

If you are degreed in EE and/or computer science with background or interest in I/O design, data communications protocols, systems software, O/S drivers, and have worked in a real time environment, we have challenging positions in:

- **OAKHURST, N.J.**
- **BINGHAMPTON, N.Y.**
- **CHICAGO, ILL.**
- **SANTA CLARA, CALIF.**
- **HOUSTON, TX.**
- **PHOENIX, AZ.**

SALES SUPPORT

To keep pace with our sales growth, we are seeking systems analysts with 2 to 3 years experience with minicomputer systems and interfacing with customers and conducting presentations involving benchmarks and standard test runs. Knowledge of assembler, FORTRAN, COBOL, operating systems, and associated support software. Ability to function in a pre and post sales support environment for a variety of hardware and software products. Opportunities currently exist in the following cities:

- **LOS ANGELES, CALIF.**
- **DETROIT, MICH.**
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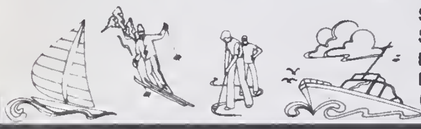

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PROGRAMMER/ANALYSTS

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Ideal candidates should have 2 to 5 years experience in systems software. Must have proven ability in OS systems generations, Assembler, and COBOL or PL.1 languages. College degree preferred.

Compensation base $28,000 to $32,000 plus profit sharing. Excellent fringe benefits and opportunity for advancement to management.

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- **Interactive Processing**
- **Data Base Design**
- **Performance Evaluation**
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  Time Sharing Systems
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  Competitive Systems
- **Configuration Management**
- **File Access Methods**
- **Operating System Development**
- **Compiler Design/Development**
- **Firmware Development**
  Design/Implement programs to measure command execution of various languages — establish techniques for measuring internal performance — working knowledge of hardware, firmware and software.
- **Diagnostic Programming**
- **Test Systems Development**
- **Telecommunications Systems Programmers**
  For S/W Development in the following areas:
  Network Architecture
  Distributed Processing
  Bit Oriented Communications
  Communication Emulation
  Communication Stress Testing
  New Product Definition Development
- **Systems Architecture**
- **Tools Support**
  — time-sharing — compiler designs/developments (high-level block structured languages) — SW tools design
- **Distributed Intelligence Architecture/Interactive Systems Software Architecture**
- **Fifth Generation OS Architecture/Interactive Systems Software Architecture**

Mr. George Rice, Manager, Professional Placement, Engineering and Manufacturing, Dept. A50, NCR Corporation, 16550 W. Bernardo Drive, San Diego, California 92127.

NCR
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Systems Analyst

INCOTERM Corporation is a leader in the development of intelligent computer display terminals. Our customers comprise airlines, financial institutions, law enforcement agencies, hospitals, railroads, and state and federal government agencies.

Our continuing exposure and larger customer base requires the addition of a Systems Analyst to our Marketing Group. The assignment will involve pre and past demonstrated technical proposal preparation, hardware and software troubleshooting and the analysis of a wide variety of telecommunication applications.

The successful candidate must have an in-depth knowledge of real time communications systems and application programming with experience in assembler language, selling or installing systems a plus. Intelligent terminals, mainframe, and communications exposure necessary.

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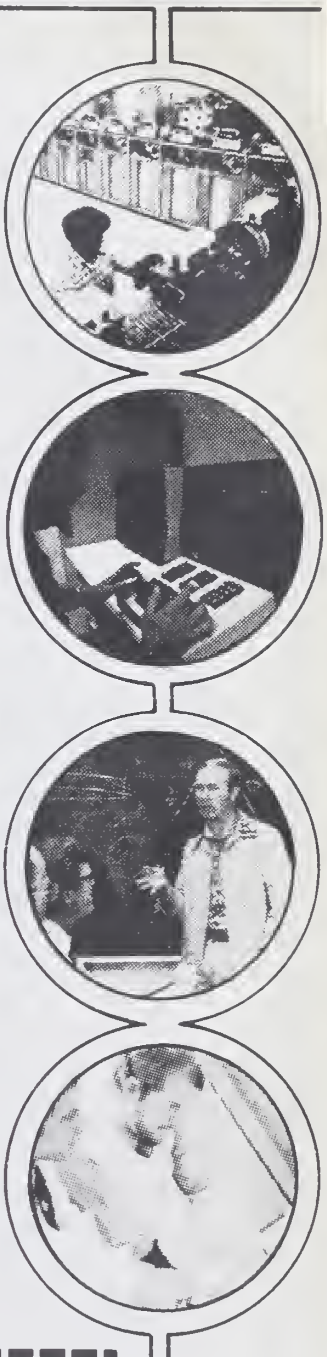

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This full time position is devoted to facilitating use of the CDC NOS and IBM HASP/MVT systems maintained by CSO. Duties include individual user assistance, user education programs, preparation of documentation, and development and acquisition of user oriented software packages. The applicant must have a bachelor's degree and must be able to work with people and communicate effectively. Knowledge of FORTRAN and use of large scale systems is required. Demonstrated skill in one or more of the following areas is desirable:

- *Selection and maintenance of mathematical packages and subroutine libraries and the expertise to advise users in their selection and use.*
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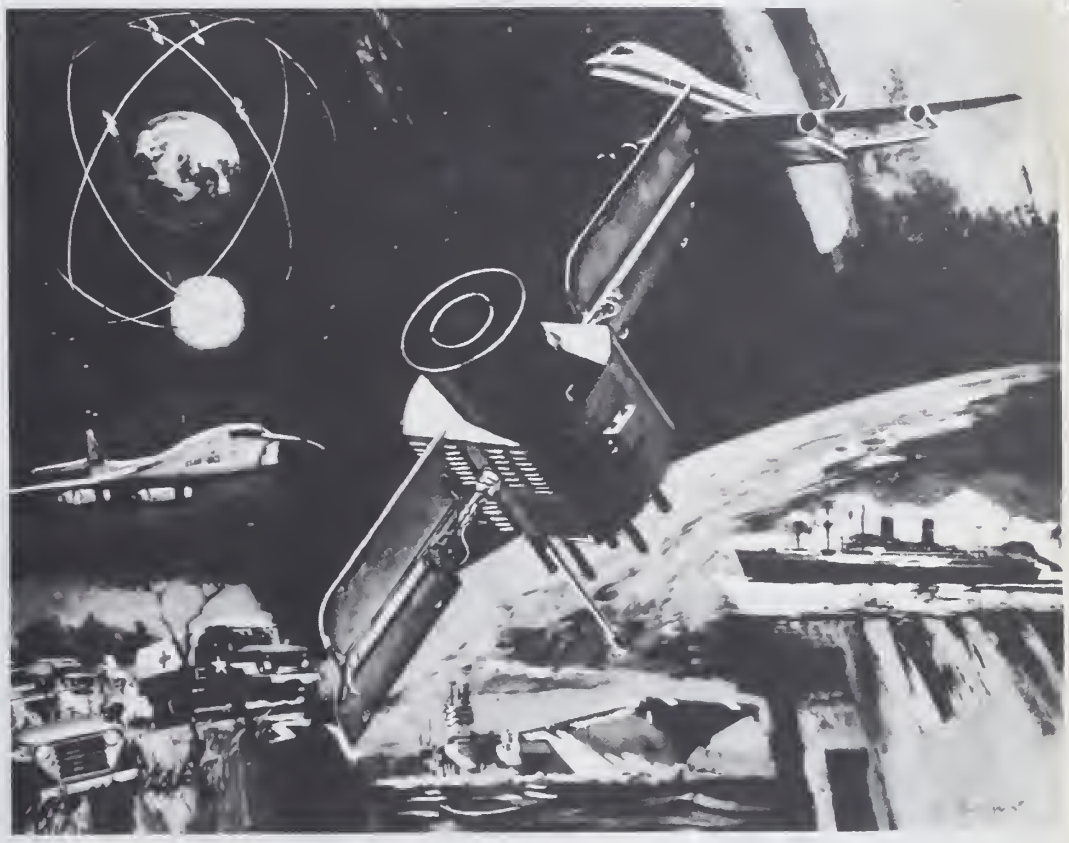

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PROGRAMMER/ANALYST

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Requires systems software implementation and modification experience, proficiency in machine language and IBM access methods. Specifically needed is MVS-, JES2 internals with knowledge of SUPERWYLBUR, TSO, CICS and VTAM desirable.

We offer an outstanding compensation package which includes generous fringe benefits and full relocation assistance. For more information send your resume to:

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engineers

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Responsibilities will include coverage of our CPU installed bases with openings available in the following areas: Atlanta, Chicago, Dallas, Boston, Long Island, North New Jersey, Detroit, Los Angeles, New York City, San Francisco, and Washington, D.C., providing Magnuson Systems customers with hardware and software support.

We are interested in VM, OS/VS1, DOS/VS, MVS professionals and 360/370 I/O and CPU Field Engineers.

We offer ground floor growth opportunity, and our compensation and benefit package includes company paid medical, dental, hospitalization, life insurance and free prescription drugs. Our salaries are very competitive and include a STOCK GRANT PLAN.

Please submit your resume to: Bill Pugelli, Magnuson Systems, 2500 Augustine Drive, Santa Clara, CA 95051. 408/988-1450 or toll-free 800/538-9657 or 800/538-9658.

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SOFTWARE SPECIALISTS

Tired of working on systems applications/programs? You can use your knowledge and skills on the development of enhancements to our systems software products. Needed are: minimum of 1 year experience with DOS/VS internals and/or OS/VS internals, BAL and TSO. Here exists future opportunities for you to get into major systems development.

Pansophic offers an excellent salary and modern benefits package. For consideration please send resume to Nancy Borst, PANSOPHIC SYSTEMS, INC. 709 Enterprise Drive, Oak Brook, IL 60521 or

Call Collect (312) 986 - 6026

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PANSOPHIC

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Applicants should have experience in 1 or more of the following areas:

- Cyber 17X, Cyber 7X or 6000 with NOS (R3 or later) system support
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- CAD experience on the CDC 170/70 or IBM 370/303X systems
- DBM experience on the CDC Cyber 17X or the IBM 370 series

Idaho Falls Openings:

Applicants should have experience on:

- Cyber 17X, Cyber 7X or 6000 with NOS/BE or SCOPE systems supports background

If you have experience in any of the above or related programming areas, we would like to hear from you. For immediate consideration please send your resume and salary history to Leroy F. Kamarainen at the address below:

Control Data Corporation
10655 N.E. 4th, Suite 200
Seattle Trust Building
Belleview, Washington 98004

or Call COLLECT
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CONTROL DATA CORPORATION

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Authors of dozens of textbooks of which 100,000 copies have been used by professionals around the world. Developers of the industry's best training courses at which nearly 40,000 programmers, analysts and managers have been enlightened. Yes, this is YOURDON! As the leading firm in the field of structured analysis, structured design and structured programming we have grown at a tremendous rate. If you've always felt like telling your managers and colleagues how software systems really ought to be developed, perhaps YOURDON is YOU!

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We need people who can put the "structured" techniques into practice, and who can help our clients do the same. Positions are available in New York, Washington, Chicago, Los Angeles and San Francisco.

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We've developed what we think is the first pragmatic technology for the analysis and design of data base systems. Your familiarity with data base theory and popular data base packages will assist you in the development of a whole new approach to data base analysis and design.

■ Microprocessor Addicts.
The application of structured techniques to the software side of microprocessors is of importance to us. If your experience is similar, you will be important too!

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If you're knowledgeable about compilers, as well as being familiar with any ALGOL-like or PASCAL-like language, our Computer Services Division offers an unending challenge.

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Newly created MIS staff department offers excellent opportunities for top analysts in two major areas of concentration:

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Individual responsible for all Engineering information requirements and systems software support. PDP 11/70 computer (time-sharing environment). Requirements are FORTRAN programming, four years information systems experience and a minimum of two years college or technical school.

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Individual responsible for all non-Engineering information requirements. Position involves much analysis and design with some high-level COBOL programming. Requirements are COBOL programming, a college degree and four years of information systems experience.

Competitive Salary and Fringe Benefits; offices located in Northwestern Ohio.

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Mr. James M. Venglarik, Manager MIS
Republic Buildings Corporation
Subsidiary of Republic Steel Corporation
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Van Wert, Ohio 45891

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Qualifications must include broad executive experience in administering a large, modern Data Processing system with diversified applications.

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Simulation Language Development

PROGRAMMER ANALYST

A Health Services Research Institute at Indiana University Medical Center (Indianapolis) is seeking a Programmer/Analyst to join in the development of a general Computer Simulation Language with national significance. Work involves language development, compiler design, programming, and applications. Applications extend to medical decisionmaking and health planning/policy analysis. Opportunity exists from major contributions to extending language capabilities and coding implementation to strong interaction with users in application and analysis.

Position requires BS and/or MS in Computer Science or equivalent, with background in data structures, compiler design, programming languages, and data base management. One to three years of employment as a programmer/analyst desired with FORTRAN and related languages. Experience with computer simulation and operations research helpful but not essential. Salary depends upon qualifications and experience. **Please send resume (if possible, college transcript) to Mrs. Joanne Lepper, 1001 West 10th Street, Indianapolis, Indiana, 46202.**

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THE STATE OF CALIFORNIA

The Military Department (California National Guard) is considering purchase of both hardware and software in order to upgrade its existing Command Information Management Systems. The new installations are to provide information within broad areas, to include accounting, personnel management and resource inventory.

Detailed information as to requirements and certain forms for prospective vendors may be obtained by contacting:

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Data Processing Services
Hdqtrs, California National Guard
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IMS Software	25k
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(918) 747-3621

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Send resume to: Computing Center; Clarkson College; Postdam, NY 13676

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We are looking for someone to assume supervisory and operational responsibility for our Hospital Information Systems and related programs. You will:

- meet with department heads and administrators establishing job requirements.
- work with the operations manager for implementation of new and revised programs and systems.
- supervise a talented group of project leaders, analysts and programmers.

A BS or equivalent knowledge of the computer science field, 5-7 years experience and strong managerial skills are required.

Systems Analyst/Programmer

We are looking for someone with a BS or equivalent broad knowledge of the technical field of systems and programming and 3-5 years experience (Cobol orientation) to plan and carry out broad assignments in the development of systems and programs.

Programmer Analyst: Cancer Care Data System

We are looking for someone with 2 years experiende in programming with medical applications and the knowledge of Artificial Intelligence Theory or Standard MUMPS language to be involved in the implementation and development of a cancer clinical information system for our Department of Medical Oncology.

Emphasis is placed on improving patient care through computer assisted data monitoring and clinical decision making.

Salary and benefits are excellent. Please send resumes to the Employee Relations Department.

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Must have Technical degree or four years Business/Accounting with Programming & Systems minor. Position will require heavy business related programming using IBM's, ANSI, COBOL, DOS/VS and CICS. Individual will be responsible for computer programming in applications areas of inventory, financial, order entry, payroll and communications.

PROGRAMMER/ANALYST

Applicant should have a degree in Computer Science with a minimum of 5 years FORTRAN experience, 2 of which should be in a real time environment utilizing a mini-computer. Will be responsible for interfacing with IBM 370-3031.

If you meet the above requirements and seek a challenging opportunity, excellent salary and benefit package, please send resume including salary history to Ms. J. Rogers:

CF&I STEEL CORPORATION
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Currently we have positions available for:

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- Responsible for the system and programming staff
- Monitors project control function
- Assist the director in planning, directing, and coordinating department activities

SYSTEMS PROGRAMMER

- 2-4 years experience with assembler language and COBOL
- 2 years experience with DOS/VS, CICS, and DL-1
- Minimum of 2 years experience identifying, analyzing and solving software problems

SENIOR DESIGNER/PROGRAMMER

- 2-4 years experience with COBOL in a data base telecom environment
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We recognize the importance of talented systems people and we pay them top salaries. We offer talented people the opportunity to build a successful career by growing with us and helping build our business.

Because we look to the future, we make substantial investments in recruiting, training, and research and development. In 1978, we spent over $3 million in these areas.

Our salary offers will be based on your experience and our assessment of your skills. Salary ranges are:

Lead Programmer Analyst	$30-35,000
Senior Programmer Analyst	25-30,000
Programmer Analyst	15-25,000

The skills we seek are:

— Basic Understanding of Computer and Systems
Knowledge of operating systems, compilers and file access methods.

— Programming Skills
Proficiency in COBOL, OS JCL, IBM utilities, diagnostic/-debugging techniques, use of text editors, use of IBM file access methods, structured programming techniques.

— Systems Design and Development Skills
Proficiency in design of large scale transaction processing systems using large direct access files; experience in designing and implementing large and complex edit/validation programs and on-line error correction programs; ability to set up and manage complex systems testing environments; ability to design and implement recovery/restart capabilities. Above all, we are looking for people with proven experience in designing "implementable" "operable" systems.

If you enjoy systems development work, we would like to hear from you. Please send your resume and salary history in confidence to Ms. Judith Ross, Manager of Professional Recruiting, and please indicate your preferred office location.

ams

AMERICAN MANAGEMENT SYSTEMS, INC.
1515 Wilson Boulevard, Dept: 7912
Arlington, Virginia 22209
Major Office in Arlington, New York,
Chicago, San Mateo.

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The Mobile Source Air Pollution Control Program in Ann Arbor, Michigan, is looking for qualified scientists or engineers to accept an Intergovernmental Personnel Act (IPA) assignment for 3 months to 2 years in length.

Applicants would be performing challenging work in such areas as: (1) the implementation of the primary control program for reducing emissions from motor vehicles and engines in compliance with the Clean Air Act of 1970, and (2) administration of the National Fuel Economy Program for the Automotive industry.

Interested persons should send a resume and any questions to: Mr. R.E. Harrington, Director, Certification Division, MVEL, U.S. Environmental Protection Agency, Ann Arbor, Michigan 48105.

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Excellent growth opportunity with national corporation for degreed Data Processing Professional with 4-6 years increasingly responsible systems and programming experience in IBM 370 OS/VS environment, including:

- *IMS* • *Batch and Online experience.*
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- *Thorough knowledge of COBOL in a commercial environment.*
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As a working supervisor, you will be responsible for systems design and implementation, applications programming and equipment operations in our East Central Pennsylvania manufacturing facility.

SALARY IN THE MID $20's RANGE
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CONTROL DATA CORPORATION

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ATTN: Walter Horton

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Marketing

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Involved with the technical systems support for Pacific Telephone Company Marketing Information Systems (MIS) and AT&T Marketing Measurement System, responsibilities will include the development of COBOL programs for regularly recurring reports from the MIS Data Base. Additionally, you will function as backup programmer for the operation of a monthly support update system for the MIS Data Bases in conjunction with revenue accounting and National CSS (Computer Vendor).

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Pacific Telephone

Management Employment Office—Marketing
44 Montgomery Street
Room 1300, Dept. 11
San Francisco, CA 94104

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Mr. Gale E. Rand
Div. of Professional Studies
Elmira College
Elmira, New York 14901

PACIFIC NORTHWEST PROGRAMMER/ANALYST

Programmer/Analyst must have two to five years of COBOL programming in a financial environment. Burroughs experience preferred and data communications background desirable. **Send resume to Personnel Department, Washington Trust Bank, P.O. Box 2127, Spokane, Washington 99210**

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Leader in the Printing and Packaging Industry, with New York, California, and Indianapolis location (D.P. center located in Indianapolis) seeks an ANALYST with 6-8 years experience. Technical or Business degree and familiarity with Cobol is required. Manufacturing experience is highly desirable.

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HP 3000 Fortran IV, Image Query experience required. The position will eventually lead to Department Manager of a fast growing company. Send resume to:

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Paramount, CA 90723

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314 Highland Mall Blvd.
Suite 406
Austin, Texas 78752

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You should have extensive experience with COBOL, BAL, CICS and ability to interact and communicate well with members of the Systems and Operating Staffs.

Please send resume and salary history to:

CW Box 1901
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EOE M/F/H

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Major computer terminals division of one of the country's leading high-technology companies has an immediate career-growth opportunity for an individual with a technical college degree and 3 years experience in mini or micro computer programming. Responsibilities will include providing In-depth software and configuration technical information and support to field analysts, potential customers, and salespeople to enhance the overall sales effort.

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Project Manager

San Francisco

Our client, an exceptionally well managed and respected San Francisco headquartered company, has asked us to recruit a top notch Project Manager or Senior Systems Analyst who is capable of managing a highly visible research project.

This person will study, evaluate and recommend a proposed solution and alternatives applying cost benefit analysis and ROI techniques. This is a broad project which will encompass investigation of current competitor's systems and state-of-the-art technology in order to build systems which will improve customer service in the coming decade.

The successful candidate will be an effective communicator, a skilled technician and a person with both the ability and the ambition to advance rapidly. Some knowledge of data base and on-line technology is a must. This person will be experienced in complex, large scale systems, from inception onward and will be competent in project management and structured design/programming.

We are consultants to management. For confidential consideration, please send resume and salary history to: **James A. Cox, Professionals for Computing, Inc., One Maritime Plaza—Suite 1350, San Francisco, CA 94111, (415) 956-7120.**

professionals for computing, inc.

Computer Product Specialist

Moore Business Forms, Inc., Research Center, is dedicated to the ever expanding research of new products, applications, equipment and information systems in the business world as they apply to the business forms industry. One such area of interest is the identification and gathering of data according to the needs of the computer industry. Thus, to meet Moore's present needs and future goals, they have immediate need for a Computer Product Specialist.

The candidate will have the responsibility to provide current, timely and technical forecasting intelligence to the corporation through a direct contact with computer equipment manufacturers. Individual will provide information and assistance to marketing services, research, sales and manufacturing departments in the area of product knowledge, support product testing and evaluation. BS Degree, with 2-3 years experience in computer products and equipment, with a strong background in systems engineering needed.

This is an exciting state-of-the-art opportunity, offering a good starting salary and excellent benefits. For further information contact: Dennis Bhame, Personnel Department, 300 Lang Blvd., Grand Island, N.Y. 14302. An equal opportunity employer, male/female.

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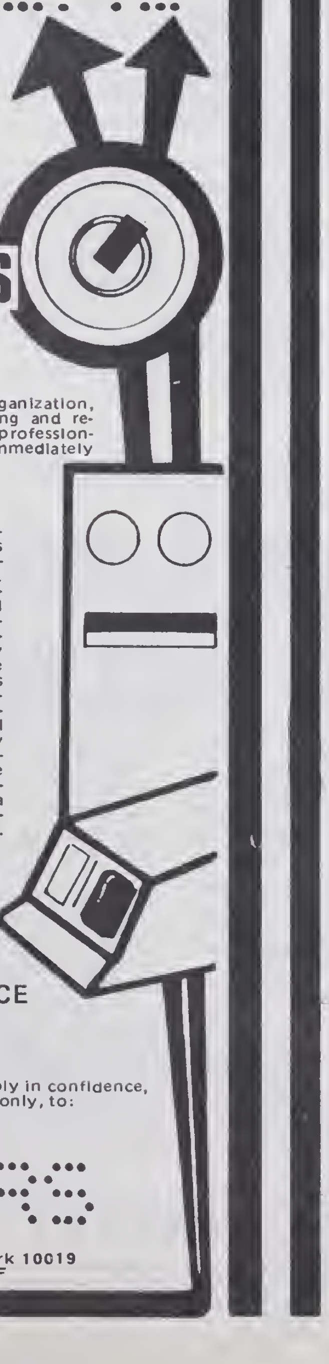

Reuters, the International news organization, has top-salaried, unusually interesting and responsible postions to offer qualified professionals. The following openings are immediately available.

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Will take charge of technical operations, computer and communications maintenance. Must have good knowledge and expertise in the PDP 11 family, mass storage and communications peripherals, TDM and FDM technology, plus data base maintenance. Position reports to US Technical Manager and entails responsibility for three operations and maintenance managers and 50-plus staff members in a unionized corporation. Successful candidate will have strong technical development and managerial background along with proven ability for providing detailed technical guidance to staff. Opportunity to solve problems in a dynamic real-time environment and to play a key role in a growing, innovative organization, offers an excellent salary. $35,000-plus.

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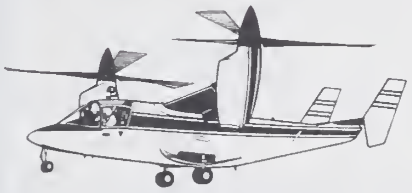

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Interested applicants should send resume, including salary history, in confidence to:

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P.O. BOX 90
IDAHO FALLS, ID 83401

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TELEPROCESSING SOFTWARE PROGRAMMER

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We seek a thoroughly experienced sales professional with a desire to educate others in product, marketing, and sales skills knowledge. This calls for a take-charge individual who can communicate well with all levels of sales, marketing and management. You should have a minimum of 2 years of successful experience in the selling of CRT based systems as well as a good working knowledge of the general marketplace.

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General Mail Center
Jacksonville, Fla. 32231
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PROGRAMMER ANALYST I

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The required qualifications include a Master's degree or equivalent experience, and several years of industrial experience in the computer field, including some managerial experience. The salary range is $16-18K.

Applicants should submit a resume and the names of 3 references to

Dr. A.J. Turner, Acting Head
Dept. of Computer Science
0-303 Martin Hall
Clemson University
Clemson, SC 29631
(803) 656-3444

The deadline for applications is May 15, 1979.

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The University of North Carolina is accepting applications for the position of Academic Services Programmer/Analyst. Applicant must have a bachelor's degree and should have several years experience working in a university computing center environment. **Send resume to Personnel Office, UNC-Wilmington, P.O. Box 3725, Wilmington, N.C. 28403.** Deadline for accepting applications is May 4, 1979 and May 7, 1979.

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Send resume and three letters of reference no later than May 15, 1979, to Dr. Donald Klett, Sangamon State University, Springfield, Illinois 62708. *An affirmative action/equal opportunity employer.*

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Barclays Bank of California has an opening at its San Jose Data Center for a programmer/analyst. This position requires a minimum of 2 years experience programming bank applications in COBOL. Burroughs Medium Systems experience desired. Please send resume to **P.O. Box 5340 or apply in person at 3550 Stevens Creek Blvd., Room 315, San Jose, California 95117. Telephone: (408)244-3500 Ext 47.**

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EOE, M/F

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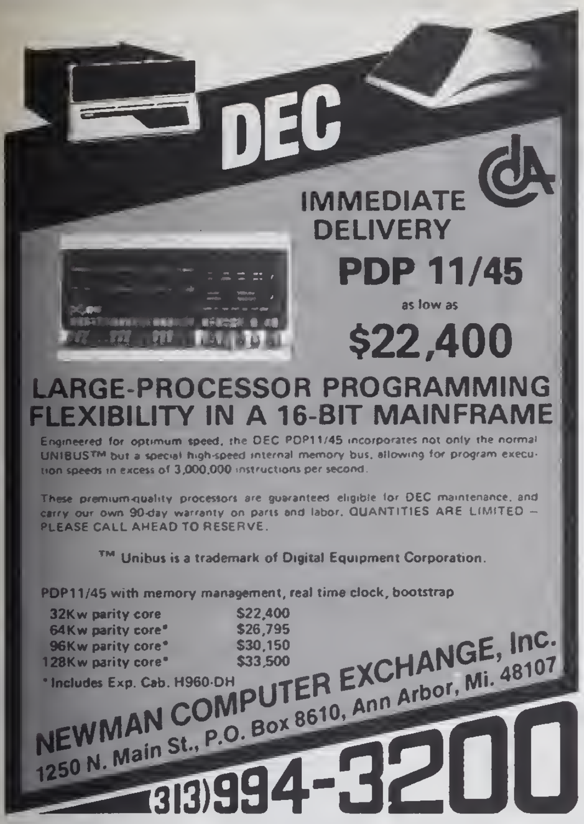

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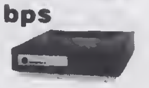
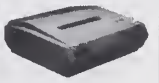
7200 bps 	**MODEM 4800/72** Dedicated line with optional multiport operation for up to three 2400 bps channels.	$6900 $165/mo.*	**$1995** **$80/mo.***
Printer 	**BRAND NEW 40+10 PRINTER** Desk top printer. Produces 80 columns of 5 x 7 dot matrix character at 110 CPS or 70 lines per minute. Parallel interface—3 month warranty.	$1650 Purchase only	**$595** **Purchase only**

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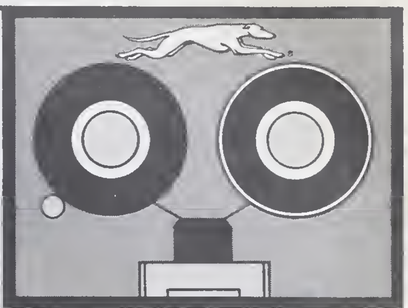

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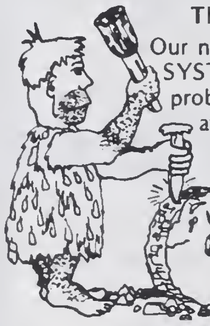

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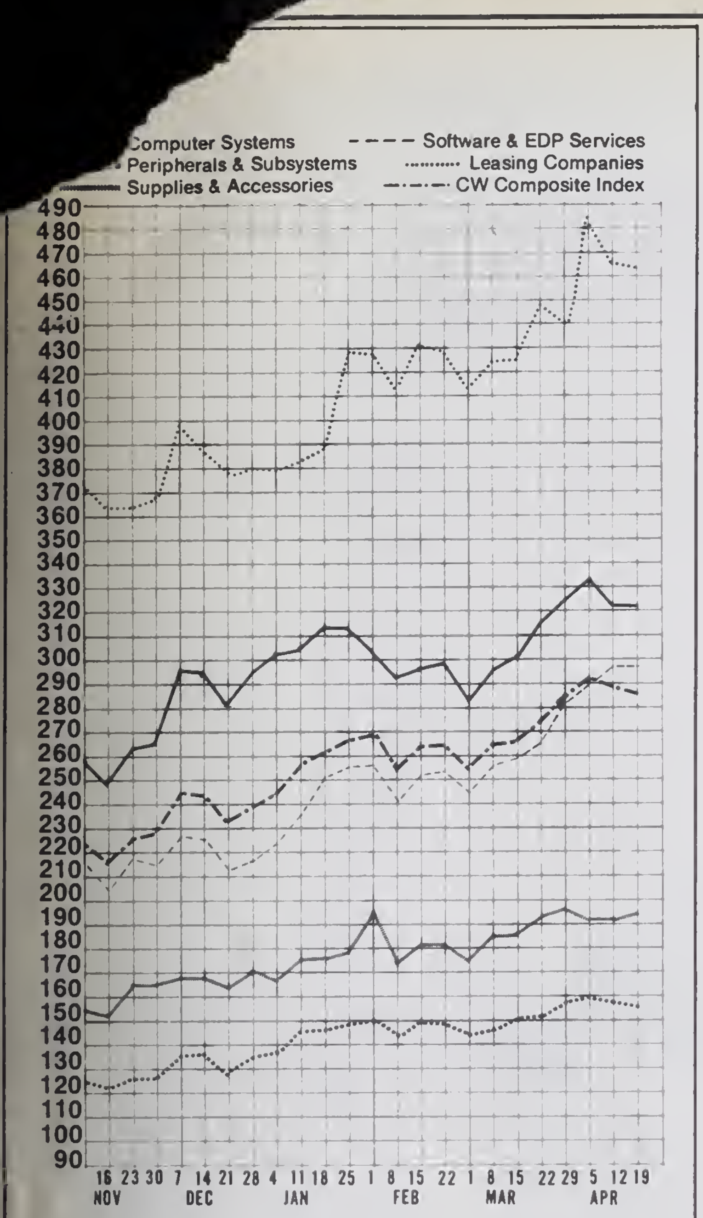

Earnings Reports

MODULAR COMPUTER SYSTEMS

Year Ended Dec. 31

	1978	e1977
Shr Ernd	$1.21	$1.24
Revenue	64,517,000	54,768,000
Disc Op Loss	...	(8,000)
Earnings	4,423,000	4,261,000

e-Restated.

PENRIL

Six Months Ended Jan. 31

	a1979	1978
Shr Ernd	$.51	$.48
Revenue	9,969,501	6,600,547
Earnings	671,471	616,187

a-Includes operations of Epicure Products, Inc., acquired in November 1978.

TELENET

Year Ended Dec. 31

	1978	1977
Revenue	$8,883,000	$4,060,000
Loss	4,972,000	4,095,000
3 Mo Revenue	2,474,000	1,376,000
Loss	1,473,000	1,290,000

DCL

Year Ended Dec. 31

	1978	1977
Shr Ernd	$1.27	$1.39
Revenue	15,403,000	15,137,000
Tax Cred	1,449,000	2,312,000
3 Mo Shr	.27	.38
Revenue	3,758,000	3,518,000
Tax Cred	276,000	1,397,000
Earnings	1,046,000	1,463,000

TELE-COMMUNICATIONS

Year Ended Dec. 31

	1978	a1977
Shr Ernd	$1.10	$ 18
Revenue	63,632,000	52,790,000
Tex Cred	1,766,000	1,221,000
Eernings	6,560,000	1,355,000

a-Resteted to reflect change in eccounting for leases.

INTEL

Three Months Ended March 31

	1979	1978
Shr Ernd	$1.10	a$.66
Revenue	135,298,000	80,256,000
Earnings	15,278,000	8,782,000

e-Adjusted to reflect change in accounting for leases.

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TRADE°QUOTES

Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, APRIL 18, 1979

All statistics compiled, computed and formatted by
TRADE QUOTES, INC.
Cambridge, Mass. 02139

COMPUTER SYSTEMS

EXCH		PRICE 1978-79 RANGE (1)	CLOSE APR 18 1979	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMDAHL CORP	28- 69	37 7/8	- 1/8	-0.3
N	BURROUGHS CORP	59- 87	71 1/2	+1 1/2	+2.1
O	COMPUTER AUTOMATION	15- 44	20	+2 1/4	+12.6
N	CONTROL DATA CORP	23- 44	34 3/8	- 3/8	-1.0
O	CRAY RESEARCH INC	8- 33	26	- 1/2	-1.8
N	DATA GENERAL CORP	42- 73	69 1/4	0	0.0
N	DATAPOINT CORP	34- 82	78	0	0.0
N	DIGITAL EQUIPMENT	39- 58	53 3/8	-1 5/8	-2.9
N	ELECTRONIC ASSOC.	2- 13	6 1/8	- 1/4	-3.9
A	ELECTRONIC ENGINEER.	9- 19	10 7/8	0	0.0
N	FOUR-PHASE SYSTEMS	19- 46	34 1/8	0	0.0
N	FOXBORO	28- 40	37	+2 1/2	+7.2
O	GENERAL AUTOMATION	7- 26	15 1/2	- 3/4	-4.6
C	GRI COMPUTER CORP	1- 3	1 3/4	0	0.0
N	HEWLETT-PACKARD CO	62- 96	95 3/4	+1	+1.0
N	HONEYWELL INC	43- 76	69 1/2	+2 5/8	+3.9
N	IBM	236-321	312	0	0.0
C	MANAGEMENT ASSIST	9- 29	21 3/4	0	0.0
O	MANUFACTURING DATA S	9- 25	22 1/2	+ 1/8	+0.5
C	MICRODATA CORP	10- 23	21 1/4	+ 3/8	+1.7
O	MINI-COMPUTER SYST	4- 8	5	0	0.0
C	MODULAR COMPUTER SYS	7- 18	16 1/2	+ 1/2	+3.1
N	NCR	37- 72	69	+1	+1.4
N	PRIME COMPUTER INC	20- 43	36 1/2	+ 3/4	+2.0
N	PERKIN-ELMER	17- 34	31	- 3/8	-1.1
N	SPERRY RAND	33- 51	49 1/4	+ 1/8	+0.2
A	SYSTEMS ENG. LABS	11- 24	16 1/8	- 3/8	-2.2
C	TANDEM COMPUTERS INC	13- 37	30	-2	-6.2
A	WANG LABS.	12- 43	40 1/4	-1 1/4	-3.0

LEASING COMPANIES

EXCH		PRICE 1978-79 RANGE (1)	CLOSE APR 18 1979	WEEK NET CHNGE	WEEK PCT CHNGE
C	BOOTHE COURIER CORP	13- 21	19 1/4	+ 1/4	+1.3
O	COMDISCO INC	3- 21	18 3/4	+ 3/4	+4.1
A	COMMERCE GROUP CORP	1- 1	1/2	0	0.0
A	COMPUTER INVSTRS GRP	1- 7	3 1/8	- 1/8	-3.8
O	CONTINENTAL INFO SYS	5- 15	8	0	0.0
M	DATRONIC RENTAL	1- 3	2 7/8	- 1/8	-4.1
A	DCL INC	3- 5	4 3/8	+ 1/8	+2.9
N	OPF INC	8- 14	11 1/4	0	0.0
N	ITEL	16- 36	21 5/8	0	0.0
N	LEASCO CORP	24- 43	41	-1 1/2	-3.5
C	LEASPAC CORP	1- 4	1 1/8	- 1/8	-10.0
A	PIONEER TEX CORP	3- 7	3 3/4	0	0.0
N	U.S. LEASING	13- 20	15 1/8	+ 1/8	+0.8

EXCH: N=NEW YORK; A=AMERICAN; P=PHIL-BALT-WASH
L=NATIONAL; M=MIDWEST; O=OVER-THE-COUNTER
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(1) TO NEAREST DOLLAR

SOFTWARE & EDP SERVICES

EXCH		PRICE 1978-79 RANGE (1)	CLOSE APR 18 1979	WEEK NET CHNGE	WEEK PCT CHNGE
G	ADVANCED COMP TECH	1- 2	1 3/8	- 1/8	-8.3
O	ANACOMP INC	8- 22	15 1/8	- 3/8	-2.4
A	APPLIED DATA RES.	8- 17	10 7/8	- 7/8	-7.4
N	AUTOMATIC DATA PROC	24- 36	31	-1	-3.1
O	COLEMAN AMERICAN COS	1- 2	5/8	0	0.0
C	COMPU-SERV NETWORK	5- 12	11 3/4	+1 1/4	+11.9
G	COMPUTER HORIZONS	1- 9	5 3/4	+ 1/2	+9.5
C	COMPUTER NETWORK	5- 16	7 1/8	- 1/4	-3.3
N	COMPUTER SCIENCES	8- 17	12 1/4	- 3/4	-5.7
O	COMPUTER TASK GROUP	1- 5	5 1/4	0	0.0
C	COMPUTER USAGE	2- 4	3	- 1/8	-4.0
O	COMPUT AUTO REP SVC	4- 10	8 1/2	0	0.0
C	COMSHARE	6- 24	23 1/2	0	0.0
O	CULLINANE CORP	14- 33	21 3/4	- 3/4	-3.3
O	DATA DIMENSIONS INC	4- 9	5 1/2	0	0.0
O	DATATAB	1- 4	3	- 1/4	-7.6
N	ELECTRONIC DATA SYS.	15- 25	20	+ 1/4	+1.2
O	INSYTE CORP	1- 3	1 1/4	+ 1/8	+11.1
C	IPS COMPUTER MARKET.	2- 3	3 1/8	0	0.0
O	KEANE ASSOCIATES	3- 6	5	- 3/8	-6.9
O	KEYDATA CORP	1- 4	4	+ 1/4	+6.6
A	LOGICON	10- 19	14	+ 1/4	+1.8
A	NATIONAL CSS INC	15- 47	46 3/4	+ 1/8	+0.2
O	NATIONAL DATA CORP	7- 13	12	+1	+9.0
A	ON LINE SYSTEMS INC	12- 30	20 5/8	- 3/8	-1.7
N	PLANNING RESEARCH	4- 10	6 1/8	- 1/2	-7.5
C	PROGRAMMING & SYS	1- 1	1	0	0.0
O	RAPIDATA INC	3- 7	6 5/8	0	0.0
C	REYNOLDS & REYNOLD	18- 36	31	0	0.0
O	SCIENTIFIC COMPUTERS	3- 9	6 5/8	0	0.0
N	TYMSHARE INC	18- 41	38 7/8	+1 1/2	+4.0
A	URS SYSTEMS	5- 8	5 5/8	- 1/8	-2.1
N	WYLY CORP	1- 7	5 3/4	- 1/8	-2.1

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1978-79 RANGE (1)	CLOSE APR 18 1979	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADDRESSOGRAPH-MULT	14- 32	16 1/4	+ 1/4	+1.5
N	AMPEX CORP	10- 19	15 3/8	+ 3/8	+2.5
C	ANDERSON JACOBSON	5- 10	7 1/4	- 1/2	-6.4
N	APPLIED DIG DATA SYS	9- 22	10 3/8	+ 1/8	+1.2
G	BEEHIVE INT'L	3- 7	4 1/2	0	0.0
A	BOLT,BERANEK & NEW	6- 14	12 3/4	- 1/2	-3.7
N	BUNKER-RAMO	10- 23	22 3/4	+ 3/8	+1.6
A	CALCOMP	3- 13	9 1/8	-1	-9.8
O	CAMBRIDGE MEMORIES	3- 9	3 3/8	- 1/4	-6.8
N	CENTRONICS DATA COMP	16- 41	40 7/8	+2 1/8	+5.4
C	COGNITRONICS	1- 4	2 1/8	- 1/8	-5.5
C	COMPUTER COMMUN.	6- 10	7 1/2	+ 3/8	+5.2
O	COMPUTER CONSOLES	4- 11	10 1/2	+ 1/2	+5.0
A	COMPUTER EQUIPMENT	3- 6	4 5/8	- 1/8	-2.6
C	COMPUTER TRANSCEIVER	1- 5	3 1/8	- 1/8	-3.8
C	COMPUTERVISION CORP	9- 48	46 1/4	+ 7/8	+1.9
C	COMTEN	9- 38	24 1/2	0	0.0
N	CONRAC CORP	13- 26	16 5/8	- 1/8	-0.7
O	DATA ACCESS SYSTEMS	3- 14	8	0	0.0
A	DATA PRODUCTS CORP	14- 25	18 3/4	- 5/8	-3.2
O	DATUM INC	2- 6	2 1/2	- 1/8	-4.7
O	DECISION DATA COMPUT	2- 6	4 1/2	+ 1/8	+2.8
O	DELTA DATA SYSTEMS	1- 1	3/8	0	0.0
A	DOCUMATION INC	6- 34	23	+2 1/4	+10.8
O	DATARAM CORP	6- 32	16	-1	-5.8
N	ELECTRONIC M & M	4- 9	4 1/8	0	0.0
O	FABRI-TEK	1- 2	3/4	0	0.0
C	GENERAL COMPUTER SYS	1- 3	2 1/4	0	0.0
O	GENERAL DATACOMM IND	9- 21	17 1/4	- 1/2	-2.8
N	HAZELTINE CORP	10- 17	15 1/2	+ 1/4	+1.6
N	HARRIS CORP	17- 36	26 3/4	+ 1/4	+0.9
O	INFOREX INC	6- 11	8 1/2	0	0.0
C	INFORMATION INTL INC	7- 12	11	- 1/2	-4.3
O	INFOTON	1- 3	3 1/8	- 1/8	-3.8
G	INTEL CORP	39- 65	63	+1	+1.6
G	INTERSIL	7- 18	13	- 1/4	-1.8
A	LUNDY ELECTRONICS	4- 8	5	+ 1/8	+2.5
C	MSI DATA CORP	10- 19	9 5/8	- 5/8	-6.0
N	MEMOREX	27- 59	35 3/4	+1 1/2	+4.3
N	MOHAWK DATA SCI	6- 15	11 3/4	- 1/4	-2.0
C	OMEX	2- 8	7	-1	-12.5
C	PARADYNE CORP	9- 18	15 7/8	-1	-5.9
O	PENRIL CORP	5- 12	10 3/8	- 1/2	-4.5
N	PERTEC CORP	9- 17	9 3/8	- 1/2	-5.0
A	POTTER INSTRUMENT	2- 2	1 3/4	0	0.0
C	RECOGNITION EQUIP	7- 13	8 7/8	- 1/4	-2.7
C	SCAN DATA	1- 5	2 3/8	-	-2.5
N	STORAGE TECHNOLOGY	19- 46	42 1/8	+1 1/2	+3.6
G	T BAR INC	11- 22	19	-2	-9.5
C	TALLY CORP.	4- 14	11 1/2	0	0.0
A	TEC INC	6- 13	7 5/8	- 7/8	-10.2
N	TEKTRONIX INC	33- 57	55	+2	+3.7
N	TELEX	3- 9	5 1/2	- 1/8	-2.2
O	TESDATA SYSTEMS CP	9- 23	17	+2 1/4	+15.2
O	WILTEK INC	1- 2	5/8	- 1/8	-16.6

SUPPLIES & ACCESSORIES

EXCH		PRICE 1978-79 RANGE (1)	CLOSE APR 18 1979	WEEK NET CHNGE	WEEK PCT CHNGE
A	AMERICAN BUS PRODS	6- 11	9 7/8	- 1/8	-1.2
C	BALTIMORE BUS FORMS	1- 4	1	0	0.0
N	BARRY WRIGHT	14- 34	17 3/8	+ 7/8	+5.3
O	CYBERMATICS INC	1- 1	3/4	0	0.0
O	DUPLEX PRODUCTS INC	13- 30	19 1/8	- 1/8	-0.6
N	ENNIS BUS. FORMS	8- 19	18 1/8	0	0.0
N	3M COMPANY	43- 66	56 1/8	-1	-1.7
C	MOORE CORP LTD	26- 34	33	- 1/4	-0.7
N	NASHUA CORP	18- 37	24 7/8	- 1/4	-0.9
C	STANDARD REGISTER	20- 27	24 3/4	+1	+4.2
-	TAB PRODUCTS CO	8- 16	13 3/8	+ 3/8	+2.8
-	WABASH MAGNETICS	10- 22	18 1/2	+2	+12.1
N	WALLACE BUS FORMS	18- 33	24 3/4	+ 1/8	+0.5

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